

***Prefinal Inspection Report  
for the OU 7-10 Glovebox  
Excavator Method Project***

**Idaho  
Completion  
Project**

*January 2004*

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Bechtel BWXT Idaho, LLC

ICP/EXT-04-00126  
Revision 0  
Project No. 021052

# **Prefinal Inspection Report for the OU 7-10 Glovebox Excavator Method Project**

**January 2004**

**Idaho Completion Project  
Idaho Falls, Idaho 83415**

**Prepared for the  
U.S. Department of Energy  
Assistant Secretary for Environmental Management  
Under DOE/NE Idaho Operations Office  
Contract DE-AC07-99ID13727**

## **ABSTRACT**

In accordance with the Federal Facility Agreement and Consent Order, the U.S. Department of Energy, U.S. Environmental Protection Agency (EPA), Idaho Department of Environmental Quality (IDEQ), and subcontracted personnel participated in a prefinal inspection of the Operable Unit 7-10 Glovebox Excavator Method Project. The inspection was conducted during two site visits and concluded prior to the U.S. Department of Energy (DOE) Operational Readiness Review. This report provides DOE Idaho Operations Office (NE-ID) responses to the comments received from EPA, IDEQ, and their subcontracted technical support personnel. Appendix A of this report contains the checklist that was provided to EPA and IDEQ for use during the prefinal inspection. Appendix B contains a table identifying the EPA and IDEQ comments resulting from the prefinal inspection as well as the BBWI/NE-ID responses previously provided to those comments. Attachment 1 to this report is an information copy of the DOE ORR Report. Attachment 2 to this report is an information copy of the DOE Authorization to Operate.



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# **Prefinal Inspection Report for the OU 7-10 Glovebox Excavator Method Project**

## **1. PURPOSE**

The purpose of this report is to document the results of the prefinal inspection for the Operable Unit (OU) 7-10 Glovebox Excavator Method Project conducted in accordance with the Federal Facility Agreement and Consent Order (FFA/CO) (DOE-ID 1991).

## **2. APPLICABILITY AND SCOPE**

This prefinal inspection report applies to the OU 7-10 Glovebox Excavator Method Project. The scope encompasses the review elements established in the Prefinal Inspection Checklist (Appendix A) or otherwise utilized by the EPA and IDEQ (hereafter referred to as the 'Agencies') during the inspection.

## **3. DESCRIPTION OF THE PREFINAL INSPECTION PROCESS**

The prefinal inspection of the OU 7-10 Glovebox Excavator Project was conducted in two separate visits. The first visit occurred the week of August 4, 2003. Due to Glovebox Excavator Method Project equipment outages, Agency representatives scheduled a second visit to complete their observations of operations evolutions. The second visit occurred on November 4, 2003. The following Agency representatives were in attendance during these visits.

Prefinal Inspection Visit	EPA Representatives	IDEQ Representatives
August 4 – 6, 2003	Wayne Pierre (EPA Region 10, Project Manager) Gary Garbacik (subcontractor) Jim McHugh (subcontractor)	Mark Clough Daryl Koch Ted Livieratos John Auxier (subcontractor) Joe Alvarez (subcontractor)
November 4, 2003	None	Mark Clough Daryl Koch

Daily debriefing sessions were held between the Agency representatives, BBWI, and NE-ID to provide early identification of issues, obtain clarification of inspector comments, review factual accuracy of statements, and coordinate additional data needs, if any. A prefinal inspection closeout meeting was held at the conclusion of the initial visit where the preliminary inspection comments were discussed.

EPA and IDEQ provided written comments resulting from the prefinal inspection to BBWI on August 24, 2003. BBWI/NE-ID provided responses to the Agency comments on October 15, 2003.

## **4. PREFINAL INSPECTION CHECKLIST**

The checklist provided to the Agencies for use during the OU 7-10 Glovebox Excavator Method Project prefinal inspection is included as Appendix A of this report. This checklist was last submitted to the Agencies in June 2003 as part of *Prefinal Inspection Checklist for the OU 7-10 Glovebox Excavator Method Project* (INEEL 2003) and incorporated resolutions to Agency comments received on the checklist based on its previous submittal as part of the Remedial Design (RD) package.

## **5. AGENCY COMMENTS**

The full text of written comments received from the Agencies following the prefinal inspection (and the BBWI/NE-ID responses) is provided in Appendix B. Refer to Section 6, below, for a discussion of principal comments that resulted in BBWI action, or for which BBWI otherwise took action. There are no open or unresolved items from the prefinal inspection.

## **6. RESPONSE ACTIONS**

No corrective action plans were generated in response to Agency comments from the prefinal inspection. However, several actions were completed during or shortly after the prefinal inspection period that were related to comments made by the Agencies. The following list provides a brief description of the principal actions:

- The project elected to remove the Packaging Glovebox System (PGS) safety light beams following a detailed evaluation of the risks associated with the moving equipment involved, the use of alternate administrative procedures, the associated glove stress (i.e., caused by pulling back and tying the gloves so as not to block the beam path), and a survey of standard glovebox practices. (Reference EPA comments #4, #30, and IDEQ comment #9.)
- While leather over-gloves were made available and planned for use inside the gloveboxes, the job safety analysis and operating procedures were modified to explicitly state that additional personal protective equipment (PPE) is required for the operation of cutting tools or handling sharp objects in the glovebox, including cut-resistant gloves/sleeves. (Reference EPA comments #5 and #35.)
- Deficiencies associated with operability of the dust suppression system were corrected and the system was available for observations during the second prefinal inspection visit by the Agencies. This issue was referenced in several Agency comments including EPA #14, #31 and #34.
- Consistent with EPA comment #17, the project revised TPR-1794 to include procedural steps for collecting biased samples.
- Consistent with EPA comment #18, the project revised the Field Sampling Plan to remove Ra-226 and soil moisture analyses.
- Consistent with EPA comment #24, various equipment repairs were completed allowing subsequent observations of operations evolutions by the Agencies.
- Consistent with EPA comment #33, neutron monitoring was made available at each PGS glovebox.



- Consistent with EPA comment #36 and IDEQ comment #4, supplemental two-way communication equipment was added to enhance the exchange of information between personnel inside and outside the drum loadout enclosures.

## **7. DATE OF FINAL INSPECTION**

Due to the deferral of the OU 7-10 Glovebox Excavator Method Project deactivation, decontamination, and decommissioning work scope, the timing of the final inspection has been rescheduled to coincide with the completion of facility shutdown activities (i.e., placement of the Glovebox Excavator Method facility into stable and known conditions). The final inspection had been planned to follow replacement of the overburden soil during deactivation, decontamination, and decommissioning as identified in the Prefinal Inspection Checklist.

## **8. DOE OPERATIONAL READINESS REPORT**

Attachment 1 of this report contains an information copy of the DOE Operational Readiness Report (summary) for the OU 7-10 Glovebox Excavator Method Project.

## **9. DOE AUTHORIZATION TO OPERATE**

Attachment 2 of this report contains an information copy of the NE-ID Authorization to Commence Retrieval Operations at the Glovebox Excavator Method Project.

## **10. REFERENCES**

DOE-ID, 1991, *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory*, Administrative Record No. 1088-06-29-120, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; Idaho Department of Health and Welfare, December 4, 1991.

INEEL, 2003, *Prefinal Inspection Checklist for the OU 7-10 Glovebox Excavator Method Project*, INEEL/EXT-02-01184, Revision 0, Idaho National Engineering and Environmental Laboratory, June 2003.



**Appendix A**

**Prefinal Inspection Checklist**  
**for the OU 7-10 Glovebox Excavator Method Project**



### **Instructions for Completing the Prefinal Inspection Checklist**

The following instructions are included for filling out the prefinal inspection checklist.

Column 2: What was Checked — Identifies the item(s) that were checked.

Column 3: Status — The reviewer(s) checking the item shall note whether the review was completed.

Column 4: Inspector — The reviewer(s) checking the item shall place their initials in this column to indicate that the review was completed.

Column 5: Date — The reviewer(s) checking the item shall note the date the review was completed.

Column 6: Comments — Reviewers shall use this column to document any comments noted during their review and may also use this column to make field notes.

Column 7: References/Field Notes — Reviewers shall use this column to document any references or to capture field notes.

Each Agency reviewer and, if used, an independent fourth party reviewer, will complete a separate checklist. These individual checklists will be combined into a single Agency submission to DOE-ID. Upon completion of the prefinal inspection, each reviewer shall fill out the signature block below.

#### **Prefinal Inspection Checklist Signature Block**

Reviewer Name (Printed)	Reviewer Signature	Reviewer Initials	Date



Prefinal Inspection Checklist for the OU 7-10 Glovebox Excavator Method Project

Review Area	What Was Checked	Status	Reviewer	Date Reviewed	Comments	References / Field Notes
<b>1. Project Documents</b>						
a. Operations Health and Safety Plan						
b. Field Sampling Plan						
c. Quality Assurance Project Plan						
d. O&M Plan						
e. Essential drawings						
f. Update to Addendum 3 to INEEL Emergency Plan/ RCRA Contingency Plan (PLN-114)						
<b>2. Procedures and Work Control Documents</b>						
a. Required Material Safety Data Sheets						
b. Emergency notification						
c. Leakage and spill response procedures						
d. Waste packaging and transportation procedures						
<b>3. Personnel Training</b>						
a. Project Training Plan (PDD-108)						
b. HASP training						
c. OSHA 29 CFR 1910.120 24 or 40 hr "Hazardous Waste Operations and Emergency Response" (HAZWOPER), as applicable						
d. OSHA 29 CFR 1910.120 8 hr supervisor						
e. Radiological Worker I or II, as applicable						
f. Conduct of Operations training						
g. Conduct of Maintenance training						
h. RCRA emergency coordinators are trained and on-site (storage personnel only)						
i. RCRA training for storage and hazardous waste management (40 CFR 264.16) (storage personnel only)						
j. RWMC Access training						

Review Area	What Was Checked	Status	Reviewer	Date Reviewed	Comments	References / Field Notes
<b>4. Environmental Compliance/Regulatory Documentation</b>						
a. ARAR Implementation Matrix						
b. NESHAPs Radiological Monitoring Plan						
c. Waste Management Plan						
d. Appendix L to INEEL RCRA Contingency/Emergency Plan						
<b>5. Facility and Infrastructure Completion</b>						
a. OU 7-10 GEM Project Turnover Package INEEL/EXT-03-00622						
<b>6. Systems and Components</b>						
a. Excavator System						
b. Fissile Material Monitor (FMM)						
c. Closed Circuit Television (CCTV) System						
d. Fire Protection System						
e. Electrical Power System						
f. Heating and Ventilation System						
g. Breathing Air System						
h. Plant Air System						
i. Dust Suppression System						
j. Criticality Alarm System						
k. Life Safety Systems						
l. Radiological Monitoring (CAM and RAM)						
m. Emissions Monitoring System						
n. Packaging Glovebox System						
o. Storage System						
p. Drum Assay System						
<b>7. Sampling</b>						
a. Sampling procedures						
b. Sample Transportation (EDF-3503)						
c. Sample Collection Logs						



Review Area	What Was Checked	Status	Reviewer	Date Reviewed	Comments	References / Field Notes
<b>8. Operating Procedures</b>						
<i>Normal Operating Procedures</i>						
a. Initial Facility Startup						
b. Overburden Removal						
c. Waste Retrieval						
d. Waste Handling, Packaging, and Storage						
e. Container Changeout						
f. Drum Transport						
g. Waste Sampling and Sample Transfer						
h. Underburden Sampling and Analysis						
i. Bag-In and Bag-Out Operations						
j. Facility Shutdown and D&D Preparation						
k. Setup, Operation and Maintenance of the Dust Suppression System						
l. Setup, Operation and Maintenance of the Operate CCTV System						
m. Setup, Operation and Maintenance of the Fissile Material Monitor						
n. Setup, Operation, and Maintenance of the Drum Assembly System						
o. Setup, Operation and Maintenance of the Emission Monitoring Systems						
p. Setup, Operation and Maintenance of the HEPA Filter and Ventilation Systems						
q. Drum Assay System						
<b>9. Contingency Plan/Emergency Response Procedures</b>						
<i>Emergency Abnormal and Alarm Response Procedures (EARs)</i>						
a. Response to Power Loss						
b. Response to Firewater Loss						
c. Response to Ventilation Loss						
d. Response to Confinement Breach						
e. Response to High Radiological Alarms						

Review Area	What Was Checked	Status	Reviewer	Date Reviewed	Comments	References / Field Notes
f. Response to an RWMC or Site Area Evacuation						
g. Response to Fire						
h. Response to Radioactive or Hazardous Material Spills						
i. Response to High Winds						
<i>RWMC Emergency Procedures/Contingency Plans</i>						
a. System shutdown notification system is in place and has been tested for proper operation						
b. Abnormal conditions procedures have been approved and issued						
c. Security surveillance and notification requirements have been established with the facility security organization						
d. Emergency alarm/notification systems have been tested						
<i>Initial Actions</i>						
a. RWMC Emergency Response Organization Activation						
b. Event Classification/Emergency Action Levels						
c. Emergency Event Notifications						
d. Initial Radiological and Non-radiological Consequence Assessment (ECC/CP)						
<i>Protective Actions</i>						
a. Determining and Implementing Protective Actions for RWMC						
b. Relocation of Evacuees						
c. Request and Control of Evacuation Buses						
<i>Operations Events</i>						
a. Transportation Accidents on the INEEL						
b. Range Fires on the INEEL						
c. Fire/Explosion at RWMC						
d. Loss of Commercial Power—RWMC						
e. Response to Natural Phenomena on the INEEL						
f. On-Scene/Unified Command on the INEEL						

Review Area	What Was Checked	Status	Reviewer	Date Reviewed	Comments	References / Field Notes
<i>Nonradiological Hazardous Materials Events</i>						
a. Nonradiological Hazardous Materials Decontamination for Emergency Workers and Equipment						
b. Nonradiological Hazardous Material Release Concentrations in Air at 30 Meters						
<i>Radiological Events</i>						
a. RWMC Facility Emergency Radiological Monitoring						
<i>Control and Mitigation</i>						
a. Emergency Exposure Control						
b. Reentry						
c. Emergency Event Termination						
<i>Recovery</i>						
a. Recovery						
<i>Command Post Operations</i>						
a. Emergency Response Organization Logkeeping						
b. Emergency Information Management System						
c. Radio Protocol						
d. Command Post/Emergency Control Center/Emergency Operations Center Relocation						
<b>10. Equipment and System Readiness</b>						
a. Personal protection equipment is identified and available						
b. Medical and first aid supplies are identified and available						
c. Fire protection equipment is identified and available						
d. Recommended spare parts are identified and available						



## **Appendix B**

### **Agency Comments Including BBWI/NE-ID Responses from the OU 7-10 Glovebox Excavator Method Project Prefinal Inspection**



# Agency Comments and Responses from the OU 7-10 Glovebox Excavator Method Project Prefinal Inspection.

This appendix provides the comments as they were provided on October 15, 2003.

REVIEWER	REF.	#	DOC & PAGE	COMMENT	RESPONSE
EPA	Draft  Pierre to Hain Ltr.   ECL-113	1	General	<p>The facility was not in a condition of readiness for operations. The outer containment structure was not sealed (i.e., doors open to the atmosphere), modifications to the PGS were in progress (e.g., glove replacement), repairs to failed components being performed, training evolutions underway, equipment testing, and the state of readiness of operations personnel are examples of situations that should not be present in advance of operations. The inspection did not meet the basic purpose defined in the checklist because the overall state of readiness was not what would be expected prior to operations.</p> <p>Although the facility construction, installed equipment and supporting hardware appear to be acceptable for satisfying the basic objectives of the GEM Project, it was not possible during this inspection to determine (through observation or other) if sufficient “exercising” of the retrieval and packaging hardware has occurred. This is very important to operational readiness to ensure the hardware and operations “bugs” are identified and corrected prior to start-up.</p>	<p>BBWI had not declared that they were ready to commence waste zone material operations at the time of the Agency pre-final inspection.</p> <p>Repairs, process evolutions to exercise the equipment, and personnel training are ongoing and will be completed prior to authorization to commence operations by NE-ID (formerly DOE-ID).</p> <p>For clarification, the WES is a weather enclosure and not a containment (confinement) structure. The doors to the WES were open in early August during the inspection because of high temperatures.</p>
EPA	Draft  Pierre to Hain Ltr.   ECL-113	2	General	<p>Initially, the documentation that was required for the walkthrough was not provided. A few drawings that were considered “pertinent” drawings were provided. These “pertinent” drawings consisted of a few electrical drawings. No mechanical, structural or process drawings were provided. Only after the review team inquired was a more complete set of drawings presented for review. Additionally O&amp;M Manuals were presented only after the team made the request.</p>	<p>Arrangements were made for the review team to access electronic versions of the documents through the INEEL Electronic Document Management System (EDMS). It was not immediately understood by BBWI that access to the electronic versions would not satisfy the review team requirements. Hardcopy versions of requested documentation were then provided in a timely manner following the Agency request.</p>
EPA	Draft  Pierre to Hain Ltr.   ECL-113	3	General	<p>It was noted that seams between the floor plates were showing cracks. After discussion with the project engineer, it was determined that these were not structural cracks but cracks in the caulking that was used to seal the panels. Also, the caulking where the WES meets the FFS has cracked. G. Garbacik mentioned that these areas might be cause for concern with regard to the working vacuum of the system. The project engineer informed Mr. Garbacik that there was no need for concern and that the caulking would not be fixed prior to startup.</p>	<p>The required negative pressure within the WES relative to atmosphere is not impacted by these minor cracks.</p>
EPA	Draft  Pierre to Hain Ltr.   ECL-113	4	General	<p>Although the project attempted to perform a number of process evolutions, equipment malfunctions prevented their performance. One of the more recurring problems was the laser assisted PGS transfer cart. The inability to move the PGS transfer cart stopped several evolution attempts. The reason for this was due to the fact that the transfer cart safety feature (the laser system) effectively locked out the PGS operator from moving the transfer cart because the laser could not be “seen” by its receptor. Even when this equipment was operating properly, the operators spent several minutes repositioning gloves and equipment to get a clear signal. Based on the</p>	<p>The safety beams have been removed from service on the gloveboxes, and the operating procedures have been revised accordingly. These changes were made following a detailed evaluation of the risks associated with the moving equipment involved, the use of alternative administrative procedures, and the risks of glove stress associated with pulling back and tying the gloves so as not to block the beam path. As a technical note, the beams did not use lasers, but optical light.</p>

REVIEWER	REF.	#	DOC & PAGE	COMMENT	RESPONSE
				<p>Team's observations, this safety feature will slow production substantially. On other evolution attempts it was not readily determined why the laser system would not work. The operators were observed continually moving the tools, adjusting the cart liners and adjusting the gloves in the gloveports to make sure that there were no obstructions to the laser pathway, to no avail. As noted in the PGS Punch list Item 41 (4/14) PGS 1 "Light beam not working". It seems that the lasers have been a concern for many months. As no video of the mockup operations was available for viewing by the inspection team, we do not know whether this problem was evident during the mockup training.</p> <p>From our observations, it appears that the lasers are not consistently hitting their target. When the lasers do not hit the target, the PGS transfer cart does not move. The lasers are a safety measure to prevent worker injury. Following are some potential options for the rectification of this problem:</p> <ul style="list-style-type: none"> <li>a. Retrofit another laser at the opposite end of the glovebox so that the mirrors can be eliminated. Unfortunately, this would require installing the device within the RCS, which is neither cost effective nor a time effective solution).</li> <li>b. Clean mirrors more often. This will help prevent the refraction of the beam. This suggestion relies on maintenance to improve the reliability of the existing system). Include a cleaning procedure in the operating procedures.</li> <li>c. Provide an optical lens (beam expander) for the laser so that the beam can be focused more clearly. These lenses are available through the local laser supplier. An optical lens would concentrate the beam if necessary. Or the optical lens could make the beam wider so that a portion of the beam would be able to reach the receptor and keep the operation moving.</li> <li>d. Allow the lasers to be overridden by the shift supervisor to make the tray drive system operable when visual confirmation that there are no safety concerns are made. This would require amendments to the training procedures to make sure that there are no gloveports being utilized during the time that the transfer carts are operational.</li> </ul>	
EPA	Draft  Pierre to Hain Ltr.  ECL-113	5	General	<p>During the evolution that was observed, the shift supervisor employed proper gloveport usage. He used the tools that were available to him to work through the surrogate waste. However the other worker utilized poor work habits with respect to the gloves themselves. The worker stretched across and used his gloved fingers to sift through the waste in order to 'find' the larger parts. This was cause for concern due to the fact that there could be shards of metal that the gloves could encounter and possibly slice through the gloves with out the worker knowing until it is too late. It was also a concern in that the glove sleeve was dragged across the waste pile.</p>	<p>The use of leather over-gloves is now required to provide an added layer of protection. Glovebox operators have been instructed to avoid allowing the "bare" sections of the gloves to make contact with the waste materials. In addition, worker aids, such as sifting screens, have been made available for use during operations.</p>



REVIEWER	REF.	#	DOC & PAGE	COMMENT	RESPONSE
EPA	Draft Pierre to Hain Ltr.  ECL-113	6	General	It was unclear which video stream from the CCTV system would be recorded? To provide a usable record for future data mining, all camera outputs should be recorded and stored.	The video streams from all cameras are recorded. No action is necessary.
EPA	Draft Pierre to Hain Ltr.  ECL-113	7	General	In review of the Project Turnover Document Package for OU7-10 (INEEL/EXT 03-00622) Item 25 states that the calibration of the backhoe weighing system was not completed. The Team was unable to confirm whether Work Order 30144 had been completed?	The calibration was performed on September 11, 2003.
EPA	Draft Pierre to Hain Ltr.  ECL-113	8	Project Documents	The basic project documents exist and appear to be of sufficient detail to satisfy requirements for GEM Project operation.	No response necessary.
EPA	Draft Pierre to Hain Ltr.  ECL-113	9	Procedures and Work Control Documents	The basic procedures and work control documents appear to exist, although they were at Rev 0 and were being updated as training progressed.	Procedures are living documents and will be revised as necessary to ensure safe and efficient operations.
EPA	Draft Pierre to Hain Ltr.  ECL-113	10	Personnel Training	<p>[1] The basic training procedures for baseline knowledge have been defined and appear to contain the principal elements necessary to satisfy health and safety requirements for GEM Project operation. [2] It was clear during the inspection that the operators required several more weeks of practical exercises before they achieve any proficiency.</p> <p>[3] Although training the PGS operators for all tasks is desirable, it may be more practical, given the short training period and an overall low radiological work experience level, that the project consider specialized teams for sensitive operations (where the consequence of failure could cause a radiological incident that would affect operations and schedule).</p> <p>[4] During the training and testing phase it is important to have senior engineering, safety, radiological control and operations personnel participate (at an intense level) in this phase by observing evolutions and providing "instant" feedback. This accelerates training and the correction of operational procedures; poor practices are identified and quickly corrected. The mockup training exercises did not present enough training for these relatively inexperienced operators (maybe 40 percent new workers). Based on observation during this inspection, the PGS operators are early on the learning curve.</p> <p>[5] The PGS gloves (i.e. through wall gloves) used during preoperational training were not the gloves specified for PGS operations. Training evolutions and testing should be performed with the final glove configuration to develop proper operator "feel" (considering all the glove layers involved), and to test the overall glove performance during simulated operations.</p>	<p>1. No response necessary.</p> <p>2. Operator proficiency training is ongoing and will be completed prior to authorization to commence operations by NE-ID.</p> <p>3. This option has already been considered and implemented where appropriate. For example, assay trailer operations are using this selective qualification approach.</p> <p>4. Senior Engineering, Safety, and Operations personnel have been participating and will continue to participate in the training process. The result of this involvement has been revisions to procedures to streamline operations.</p> <p>5. Technical issues with the gloves are being resolved and operations personnel will have adequate opportunities to practice with the final glove configuration prior to authorization to commence operations by NE-ID.</p>

REVIEWER	REF.	#	DOC & PAGE	COMMENT	RESPONSE
EPA	Draft Pierre to Hain Ltr.  ECL-113	11	Environmental Compliance / Regulatory Documentation	The basic environmental compliance/regulatory documentation exists.	No response necessary.
EPA	Draft Pierre to Hain Ltr.  ECL-113	12	Facility and Infrastructure Completion	<p>The facility was completed as the project documentation stated. There were some modifications due to constructability issues. Specific instances were discussed between G. Garbacik and the project engineer. An issue discussed had to do with the conflict between the locker room and the WES structure. The supplier wanted to employ a standard structure to support the exterior fabric. There was conflict with the structure with respect to the placement of the lockers room. The structure was modified accordingly. The procedures that were followed to complete these design changes were adequate to complete the structure within the structural design criteria.</p> <p>The basic documentation exists. However, the overall facility readiness cannot be evaluated without extensive viewing of operations. This limited inspection indicates that facility construction, installed equipment and supporting hardware appear to be acceptable for satisfying the basic objectives of the GEM Project.</p>	No response necessary.
EPA	Draft Pierre to Hain Ltr.  ECL-113	13	Systems and Components	<p>Documentation states that contamination levels may exceed <math>1\text{E}+06</math> dpm per <math>100\text{ cm}^2</math> during "hot" operations within the RCS, and adequate PPE will be available to allow personnel entry. The breathing air supply trailer was not in position during the inspection. It was not clear what training evolutions (using supplied air) have or will be conducted in the RCS environment.</p> <p>One should not assume that RCS entries will be a low probability event, especially with new equipment with limited life testing. The failed limit switch is a case in point. If contamination levels are significantly greater than expected, personnel entry may be a problem. The RCS air sampling equipment should be tested for use at the RCS and HEPA filter inlet sampling points?</p>	<p>The breathing air trailer has been returned to the RWMC and is stationed ready to provide breathing air to WMF-671.</p> <p>Presently there are no plans to make entries into the RCS during waste retrieval operations. If issues arise requiring entry into the RCS then appropriate work documentation will be developed based on the conditions inside the RCS at that time. The need for specialized personnel training, dry runs, etc., will be addressed at that time. Personnel required to make such an entry will have the appropriate radiological and respiratory training and qualifications.</p> <p>RCS and HEPA filter air sampling equipment and hook-ups will be tested prior to actual waste retrieval operations.</p>
EPA	Draft Pierre to Hain Ltr.  ECL-113	14	Systems and Components	<p>The dust control water misting system was not operational because of testing and operational problems. The vendor that supplied the equipment is involved; the system is tagged out for the time being. This is an important element in operations and after correction of problems must be thoroughly tested under conditions that simulate heavy dust generation.</p> <p>Not having this system available during training and equipment testing could compromise overall contamination control objectives; also, impact on the HEPA filters cannot be evaluated with respect to operational conditions. Dust suppression methods could shorten HEPA life.</p>	The dust suppression system deficiencies have been corrected and the system has been returned to service, thus permitting training.

REVIEWER	REF.	#	DOC & PAGE	COMMENT	RESPONSE
EPA	Draft Pierre to Hain Ltr.  ECL-113	15	Systems and Components	The excavator system appeared to operate within the confines of the design criteria. There was a change out of a limit switch on PGS1 that was observed. With the new (limit switch was from the mockup) the PGS waste transfer cart operated smoothly. The use of the CCTV system was presented and the digface was viewable from the control center within the WES. Alarm use was not demonstrated. However, System Operability test records indicate that testing of the components has taken place.	No response necessary.
EPA	Draft Pierre to Hain Ltr.  ECL-113	16	Equipment and System Readiness	G. Garbacik inquired about what the project team would to in the case of a tear or hole in the WES. It was explained by the project engineer that there was additional WES fabric available and the hole patching procedure was simple.	No response necessary.
EPA	Draft Pierre to Hain Ltr.  ECL-113	17	Sampling	[1] The project documents relative to sampling and analysis exist and appear to be of sufficient detail to satisfy the basic data needs and requirements for GEM Project operation. The capabilities and procedures of the INTEC Laboratory appear to be satisfactory to meet SAP requirements.  [2] The cognizant engineer for the SAP should observe (during training evolutions) the PGS waste/soil sampling operations, the simulated RCS underburden coring, and core handling to ensure performance of the operating/sampling procedures meet requirements. [3] Procedure for selecting biased samples needs to be developed.	1. No response necessary.  2. The sample coordinator has been instrumental in the development of the operating/sampling procedures and in ensuring that applicable requirements have been addressed therein. The sample coordinator has also been participating, and will continue to participate, in the operator training process. Operator proficiency training is ongoing and will complete prior to authorization to commence operations by NE-ID.  3. TPR -1794 has been revised to include biased sampling.
EPA	Draft Pierre to Hain Ltr.  ECL-113	18	Sampling	1. Although Ra-226 was identified as a contaminant in various INEEL locations; this conclusion was in error because the evaluation of data shows that the interpretation of Ra-226 presence was the result of uranium-235 interference at the Ra-226 185 keV gamma spectral line.  2. The SAP designated sample size for moisture analysis could compromise other more valuable attributes. Considering the core sample condition, sub-sampling, processing and analysis, the moisture results most likely have little meaning. The Laboratory SOW and cost estimate does not include moisture analyses.	1. It is agreed that the Ra-226 indication is the result of U-235 interference. The Field Sampling Plan has been revised to remove the Ra-226 analysis.  2. OU 7-13/14 has determined that soil moisture samples are no longer required. The Field Sampling Plan has been revised to implement this change. The Laboratory SOW does not include moisture analysis since it will not be performed.
EPA	Draft Pierre to Hain Ltr.  ECL-113	19	Operating Procedures	A set of normal operating procedures exist (Rev 0) and covers the major elements of the GEM Project. However the limited observations during the inspection indicate that operational readiness and personnel training are early in the "learning curve".	Operator proficiency training is ongoing and will be completed prior to authorization to commence operations by NE-ID.
EPA	Draft Pierre to Hain Ltr.  ECL-113	20	Operating Procedures	**As described by project personnel, the drum breakup tray is to be used only for sizing drums near the underburden. It should be used for sizing any drum. Using it just when one is near underburden is not consistent with the GEM Project TFRs.  The TFRs state that the excavator shall be able to size an intact drum in the pit in a manner that does not	TFR-2527, Rev. 3, "Technical and Functional Requirements for the OU 7-10 Glovebox Excavator Method Project," September 2002, states (section 3.1.2.1-6.) "The project shall use methods and techniques to minimize the spread of contamination from waste zone material into the overburden and underburden

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				contaminate the surrounding waste zone or the underburden.	<p>material.” The stated basis for this requirement is the “WAG 7 Analysis of OU 7-10 Stage II Modifications,” October 1, 2001, Section 4.3, Process Description.</p> <p>TFR-153, Rev. 2, “System Design Criteria for the OU 7-10 Glovebox Excavator Method Project, Excavation Design Criteria,” October 2002, stated (Section 3.1-21) “The excavator shall be able to size an intact drum in the pit in a manner that does not contaminate the surrounding waste zone or the underburden.” The stated basis for this requirement is that “Drums that exceed the 350-lb weight limit of the transfer cart and the packaging glovebox system will require sizing at the digface.” The project recognized in January 2003 that the inclusion of “surrounding waste zone” was not supported through logical traces to TFR-2527. This reference has therefore been removed in Rev 4 to TFR-153, issued in April 2003.</p> <p>The design requirements of the project are fulfilled by having an excavator system which is capable of performing this sizing, and by having a drum sizing tray which is capable of holding the drum to be sized.</p> <p>The question of when the drum sizing tray may be, or should be, used relates to operational, not design, objectives. Use of the drum sizing tray for sizing “any” drum will increase project duration and costs, since it takes time to change out end-effectors. Such use is neither necessary nor consistent with project requirements. The operational objectives of the project are cited in TFR-2527 as stated above, and pertain primarily to minimizing the spread of contamination from waste zone material into the underburden. As previously stated, these objectives do not include a specific requirement relative to cross-contamination of waste zone material.</p> <p>Furthermore, use of the drum sizing tray is not the only method which will minimize the spread of waste zone material. Placement of drums to be sized on interstitial soil which has already been sampled, or placement of drums on underburden which has already been core sampled, are equally acceptable.</p> <p>However, the project does have operational objectives of obtaining interstitial soil samples, which exclude any visually obvious sludge, graphite, or debris waste, and of obtaining underburden core samples. Therefore, the project intends to using the drum sizing tray as necessary in order to obtain valid interstitial soil and underburden samples.</p> <p>Certain practical limitations exist with regard to sampling for interstitial soils, as</p>

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					<p>defined in INEEL/EXT-02-00542, Rev. 1, "Field Sampling Plan for the OU 7-10 Glovebox Excavator Method Project," March 2003:</p> <p>"It must be noted that this sampling will be performed on a best-efforts basis, but that various factors exist that may compromise sample integrity. These factors include the following:</p> <ul style="list-style-type: none"> <li>• Natural mixing that will occur during the excavation process</li> <li>• Material sloughing from the side walls, which will increase with depth of excavation</li> <li>• The high possibility for cross-contamination as a result of mixing, sloughing, and material handling.</li> </ul> <p>No provisions for cleaning or decontaminating the excavator's end effector, transfer carts, or gloveboxes will be available during the retrieval of waste zone material. Therefore, cross-contamination between successive excavation activities is a possible and unavoidable outcome during waste retrieval operations."</p>
EPA	Draft Pierre to Hain Ltr.  ECL-113	21	Operating Procedures	<p><b>**The fissile material monitor procedure and software has a 30,000-count/second gross count stop. If the equipment encounters this gross count, the operator is instructed to remove some waste material from the container. No estimate of fissile content is provided until this "stop" condition is satisfied. This added operation wastes operator time and adds unnecessary complexity.</b></p> <p>For example, if the waste removed contains 30 grams of Pu-239 and the gross count condition is satisfied, what happens next? The FMM should provide a fissile material content under any condition and apply an appropriate uncertainty. Considering that all waste material is not being screened/analyzed, the overall drum loading FGE accuracy is not high. Therefore, this gross count stop is not justified.</p>	The 30,000 count per second limitation on FMM measurements was included to provide assurance that rate effects would not affect the response of the FMM. To modify the FMM software to provide a measure of Pu-239 at any count rate with appropriate uncertainties would require some significant testing and software changes to bound the uncertainties for higher rate measurements. In considerably higher rates, the FMM would still be unable to perform the measurements. In any event, at higher rates the Pu-239 data would likely require a trained analyst. Thus, additional engineering and testing are not determined to be warranted at this time.
EPA	Draft Pierre to Hain Ltr.  ECL-113	22	Operating Procedures	<p>Small off-the-shelf commercial vacuum cleaners were observed inside the PGS and in the drum out containment area. However, it was unclear whether these will be part of the glovebox operations, or whether HEPA filtered vacuum cleaners be employed.</p> <p>Procedures to address the concern for contamination dispersal by the exhaust flow, or spread via release from the non-HEPA vacuum exhaust are required.</p>	A non-HEPA filtered vacuum is permissible inside the glovebox as this is an enclosed Contamination Area that is exhausted through HEPA filters. Vacuums used elsewhere will be HEPA filtered.
EPA	Draft Pierre to Hain Ltr.  ECL-113	23	Contingency Plan / Emergency Response Procedures	The basic contingency plan/emergency response procedures have been defined and appear to contain the principal elements necessary to satisfy emergency response requirements for GEM Project operation. This does not mean that the personnel level knowledge and performance during an emergency condition will be satisfactory. This performance relates to personnel training to these procedures.	Emergency response procedures have been revised to some extent, and personnel training has also continued accordingly.

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EPA	Draft Pierre to Hain Ltr.  ECL-113	24	Equipment and System Readiness	<b>**</b> The overall facility readiness cannot be evaluated without extensive viewing of operations, which was not possible given the lack of training and equipment malfunctions.	BBWI had not declared that they were ready to commence waste zone material operations at the time of the Agency pre-final inspection.  Equipment repairs have been completed. Operator proficiency training is ongoing and will be complete prior to authorization to commence operations by NE-ID.
EPA	Draft Pierre to Hain Ltr.  ECL-113	25	Equipment and System Readiness	The PGS gloves (i.e. through wall gloves) used during preoperational training were not the gloves specified for PGS operations. Glove change-out was observed during the inspection, although they were not the Viton gloves to be used during hot operations.	See response to Comment #10, final paragraph (i.e., #5).
EPA	Draft Pierre to Hain Ltr.  ECL-113	26	Equipment and System Readiness	It was not possible during this inspection to determine (through observation or other) if sufficient “exercising” of the retrieval and packaging hardware has occurred. This is very important to operational readiness to ensure the hardware and operations “bugs” are identified and corrected. Once waste retrieval operations commence, correcting problems or failures within the RCS and PGS are major issues.	BBWI had not declared that they were ready to commence waste zone material operations at the time of the Agency pre-final inspection.
EPA	Draft Pierre to Hain Ltr.  ECL-113	27	Equipment and System Readiness	[1] The assay system (Eberline rental) is rather antiquated with regards to current day waste assay methodology. [2] The system is not shielded and is subject to background fluctuations. [3] It is important that Stage II provide data to evaluate assay methodology and capability with regards to the needs of Stage III. [4] The INEEL physics group used to develop the FMM should be actively involved with the GEM Project soil/waste assay system. The GEM Project FMM systems are more sophisticated than the current designated assay system. This INEEL physics group should recommend a course of action for assay and have responsibility for technical assistance, oversight, calibrations and qualification of the equipment and personnel to perform as required. [5] When Stage II is complete, it is important to have a valid basis for assessing assay capability. This is consistent with the Stage II TFRs.	[1] The system meets the requirements of the project (e.g., SPC-417) and similar systems are in use throughout the DOE complex. The NDA system is cost-effective and adequate to perform the required functions.  [2] The system does not require shielding because background fluctuations are insignificant when making determinations in the 100 nCi/g TRU range.  [3] The GEM Project will obtain data that would allow evaluation of the NDA system for making determinations in the 100 nCi/g TRU range and for estimating drum fissile material loading. It should be recognized that the Stage III requirements will involve a WIPP-certified assay system for making TRU-waste determinations and quantifying tracked radionuclides rather than simply ensuring safe and compliant storage as required for Stage II.  [4] The INEEL physics group has been involved in the review and approval of the NDA assay system. Eberline technical support personnel will aid the trained and qualified operators during the first few weeks of operations.  [5] The basis for assessing the NDA capability is the project requirements (e.g., DQOs, TFR-158, and SPC-417). These requirements address nondestructive assay to ensure safe and compliant storage of the packaged waste.
EPA	Draft Pierre to Hain Ltr.	28	Equipment and System Readiness	The FMM is located at the far end of the glovebox. Inlet air enters at the upper end area of the glovebox. It might be advisable to smoke test the PGS system near the area of the fissile monitor to ensure no back currents exist that could increase probability of contamination reaching this area of the glovebox. This	Smoke testing the PGS is not considered to be viable, nor necessary, because a) results would be applicable only to the specific internal PGS configuration tested (i.e., specific hoist and cart locations) and b) previous analysis has already identified a

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	ECL-113			could increase background that would require cleanup actions. This impacts operations.	<p>potential for back currents and contamination to occur in the area of the FMM. The FMM was, therefore, designed with this condition in mind. Specifically, the FMM provides a continuous background radiation check. The results of these measurements are tracked in control charts. Should these measurements indicate a background increase above a previously determined level, the FMM analysis routines would not permit further specimen measurements.</p> <p>The specimen chamber was also designed to permit cleanup as necessary in that the specimen chamber shielding walls are removable for cleaning.</p>
EPA	Draft Pierre to Hain Ltr.  ECL-113	29	Equipment and System Readiness	The new tools for drum breakup (i.e., those without threads) were designed to correct a thread failure problem. Has the new design been tested sufficiently to ensure functionality and failure resistance so delays are not encountered in retrieval operations?	<p>For clarification, a non-threaded (i.e., pinned) design was the original manufacturer's supplied part. The project has always intended to use this design. An alternate design, with a threaded connection, was being evaluated to determine if this type of connection would simplify installation (i.e., through the gloveports). It was this alternate threaded design that failed.</p> <p>The project has a ready supply of both the pinned and threaded tool types, including adequate spares. Both types can be used without impacting retrieval operations; however, the threaded tool types are recognized to be more susceptible to failure.</p>
EPA	Draft Pierre to Hain Ltr.  ECL-113	30	Equipment and System Readiness	The PGS tray movement interlock (laser beam system) appears to present some operational difficulties. Laser alignment, gloves, tools placed in the beam, etc. lockout tray movement and operators search for and correct the problem. The tray movement is slow and does not appear to present a significant safety hazard to PGS operators. If this problem impacts operations, one might consider a flashing light, or similar indicator to alert PGS workers to tray and crane movement.	See response to Comment #4.
EPA	Draft Pierre to Hain Ltr.  ECL-113	31	Equipment and System Readiness	The dust suppression system was not operational during the majority of the training evolutions. Even though it is planned to change out HEPA filters before operations commence. It is important to evaluate dust suppression performance and impact on HEPA life before "hot" operations begin. The excavation plan states that when the dust suppression system is used, HVAC operations will be monitored to ensure that adequate air flow is maintained (e.g., prevent clogged or wetted filters). Has enough testing been performed to evaluate this concern?	<p>BBWI does not believe filter plugging or wetting will be a concern during operations. The following points are provided to support this position:</p> <ol style="list-style-type: none"> <li>1. <b>HEPA Wetting from Fogging System.</b> The fogging droplet size (i.e., 10 micron) was specified for the system to ensure that dust is controlled at the dumping locations. Observations during system testing showed that a) fogging pattern was not discernibly altered by changes in the HVAC flow (0 to 7000 cfm) and b) the fog droplets evaporated prior to the exhaust air intake. The following features of the filtered exhaust system mitigate the risk of wetting of the HEPAs from the fogging system causing an operational impact: a) in-line mist eliminator, b) in-line heater, c) presence of prefilters, and d) multiple, isolatable flow paths that</li> </ol>

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					<p>allow prefilters to be changed out without suspending operations.</p> <p>2. <b>HEPA Wetting from Water Spray System.</b> The design includes a digface water spray system to reduce the generation of dust at the digface. The large droplet size associated with the spray system reduces the potential for the spray to be carried by the ventilation airflow. The features identified in #1 (above) will effectively mitigate the risk that the water spray system could cause the HEPAs to become wetted and, thereby, result in an operational impact.</p> <p>3. <b>HEPA Wetting from Condensation.</b> The in-line heater was included in the design to address this possibility. This feature prevents water vapor in the air within the RCS from condensing on the filters, even if the air is saturated (i.e., 100% relative humidity), by heating the air prior to reaching the prefilters. This feature is common in H&amp;V designs.</p> <p>4. <b>HEPA Plugging from Generated Dust.</b> The possibility that the certified HEPA filters might become plugged by dust resulting in an operational impact has been mitigated by the standard method of providing prefilters upstream of the certified HEPA filters. Additionally, the design includes multiple, isolatable flow paths so that the prefilters can be changed out without interrupting retrieval operations.</p> <p>As indicated in the comment, the H&amp;V system will be monitored during operations. This will be true particularly during overburden removal, which is likely to be the dustiest period of operations. Adjustments, if necessary, in the planned use of the dust suppression could be made at that time.</p>
EPA	Draft Pierre to Hain Ltr.  ECL-113	32	Other Observations	<p>The radiological control technician was not observed logging neutron and gamma readings from the transfer cart entering the PGS system.</p> <p>This information should be logged as it is useful for future evaluations. The radiological engineer indicated that this was planned even though the Technician did not perform the function during the PGS training evolution.</p>	<p>The procedure only requires that the RCT verify that the material is less than 28 mR/hr at the glovebox exterior. These measurements will not be recorded on survey maps or for individual scoops. Drums and samples removed from the PGS will be measured and the results recorded.</p>
EPA	Draft Pierre to Hain Ltr.  ECL-113	33	Other Observations	<p>Neutron monitoring equipment was not available at each PGS station. The equipment designated for use is a newer model and project personnel as being available identified only two instruments.</p>	<p>Neutron monitoring equipment is now available at each PGS glovebox.</p>



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EPA	Draft Pierre to Hain Ltr.  ECL-113	34	Other Observations	During one evolution, the excavator bucket operator dumped soil/waste into the PGS tray without taking care to prevent spill over. Soil was observed dropping off the pile and tray into areas below the tray. Further, the height of the soil/waste pile was two times the tray depth. We were unable to observe the water misting/dust suppression system as it was tagged out for operational concerns.	With additional proficiency, operations will minimize the spillage of materials.  Deficiencies associated with the dust suppression system have been corrected and the system has been returned to service.
EPA	Draft Pierre to Hain Ltr.  ECL-113	35	Other Observations	[1] Leather gloves were used in waste sorting and digging through the waste pile; however, the sleeves of the rubber gloves were in contact with the waste pile during these operations and presented penetration concerns if sharp objects encountered. The “rubber” gloves chosen for these operations were very loose fitting about the lower arm. [2] Radiological engineering personnel should be observing all training evolutions to modify or change practices or equipment with respect to observed radiological concerns. All operators were observed (in this brief observation) to check their hands upon removal from the PGS gloves; however, this practice must be completely institutionalized for contamination control purposes. Careful observation during the training evolutions can make this happen. Also, clearly defining operations requiring leather gloves appear necessary. Procedures probably state these requirements; however, PGS operators appeared to be inconsistent with the reviewer's concept of operations requiring leather gloves.	1. The use of leather over-gloves is now required to provide an added layer of protection. Glovebox operators have been instructed to avoid allowing the “bare” sections of the gloves to make contact with the waste materials. Additional tools have been added to the available equipment inside the gloveboxes to aid operators in examining and sorting the waste zone material.  2. ES&H personnel are performing periodic evaluations of operational activities to better assure that ALARA and Safety principles are being implemented.
EPA	Draft Pierre to Hain Ltr.  ECL-113	36	Other Observations	Operators in PPE performing a “drum out” operation within the containment tent experienced considerable difficulty communicating with personnel outside the containment tent. It appeared that operators were encountering some difficulty with the bag sealing sequence and were seeking advice. This problem should be addressed.	A supplemental set of two-way communications has been added to enhance the exchange of information between personnel inside and outside the drum loadout enclosure.
EPA	Draft Pierre to Hain Ltr.  ECL-113	37	Other Observations	One PGS operator exiting the containment tent improperly removed his PPE. The proper sequence for removal of anti-contamination clothing was not followed. Recovery from this event could have resulted in personnel contamination if the event took place during hot operations. The radiological control technician performed an improper alpha foot survey (i.e. used the survey probe as if it was a beta/gamma survey). Operations personnel are very early on learning curve for a very sensitive radiological operation.	Operator proficiency training is ongoing and will be completed prior to authorization to commence operations by NE-ID.  Regarding the RCT performing an improper alpha foot survey, RCTs are trained on proper frisking methods, if this was observed, normal management oversight will correct this deficiency.
DEQ	Draft Pierre to Hain Ltr.  ECL-113	1		The gloves used for training the operators did not have sufficient taper to avoid being dragged through the soil during sorting. We understand they were not the type that will be used during production cycles, nevertheless there appeared to be more glove-in-soil sorting than necessary given the special tools provided to perform this “screening” task. Additionally, less use of the gloves for direct sorting will prolong their life.	See response to EPA Comment #35.

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DEQ	Draft Pierre to Hain Ltr.  ECL-113	2		It was ascertained that a glovebox team consists of four operators. At times it was not possible to discern which four individuals were indeed the “team” given the number of other personnel talking to or performing tasks within the same area and changes in procedure given mechanical breakdowns. Practices appeared too casual with personnel placing hands or feet, and/or leaning in ways stressful to equipment or in spreading of contamination. One example is the placing of feet on the metal strip below the glovebox that protects the drum load-out enclosure.	The PGS glovebox teams have been clearly identified and are now assigned to cover all four rotating 4-12 shifts that support 24/7 project operations. The concerns identified in this comment have thus been eliminated.
DEQ	Draft Pierre to Hain Ltr.  ECL-113	3		The drum load-out system appears crude compared to the elaborate design used in most aspects of GEM. It will require frequent maintenance of the enclosure, flooring, and seal joints. The bagout system should be staged for simple closing. For example, the gloves on the bagout sleeve should be turned in to allow easy insertion of the hands.	The drum load-out system and enclosure meet specified design requirements. It is the project intent to provide cost-effective rather than elaborate systems to meet these requirements.  Maintenance of the enclosure, flooring, and seal joints is addressed through daily inspections and repair when necessary.  Operations personnel will have additional opportunities to practice and improve techniques associated with the gloves installed in the drum bagout sleeve prior to authorization to commence operations by NE-ID.
DEQ	Draft Pierre to Hain Ltr.  ECL-113	4		Communications within the drum load-out enclosure is very poor with full protective clothing. We heard that throat mikes did not work very well but that new measures will be taken such as moving the squawk boxes?	See response to EPA Comment #36.
DEQ	Draft Pierre to Hain Ltr.  ECL-113	5	Drum Assay System	Filled drum assay: The equipment is limited and the calibration appears subject to large uncertainties. In our opinion, the technician that was interviewed was lacking adequate knowledge of the equipment and its usage to generate acceptable assay calibration given the soil/waste matrices expected.	The assay equipment meets the requirements of the project. Also see response to EPA Comment #27, first paragraph.  All operators are subject to a qualification checklist that includes confirming that they understand and can perform calibrations. Operator proficiency training is ongoing and will be completed prior to authorization to commence operations by NE-ID.
DEQ	Draft Pierre to Hain Ltr.  ECL-113	6		The RCTs monitor for gamma and neutron as the transfer cart enters the PGS. It is not clear that this monitoring is useful except for go/no go levels (28 mR/hr in TPR-1794 at the PGS window). In particular, the neutron monitoring is for mR/hr and there is no provision for estimating the source or changing work rules. Information from the RCT could aid the operators in sorting materials and using the fissile monitor.	It is correct that the 28 mR/hr criteria is a go/no go determination for material to enter the glovebox. However, periodic monitoring will occur at other locations during glovebox operations.  Radiological information will be available to operators for their use.  Also see response to EPA Comment #32.
DEQ	Draft Pierre to Hain Ltr.  ECL-113	7		The RCTs frisk for alpha contamination. The observed frisking was too fast and too far from the surface to be effective. It is very important that the RCTs ensure that the operators self monitor their hands after exiting the gloves.	RCTs are trained on proper frisking methods, if this was observed, normal management oversight will correct this deficiency.  The requirement for operators to frisk their hands after removing them from the gloves is included in the operating procedure. RCTs and management will remain vigilant to ensure procedures are followed.

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DEQ	Draft Pierre to Hain Ltr.  ECL-113	8		The position of the fissile monitoring system and its shielding make loading and cleanup difficult. This system should be used sparingly and more reliance placed on measurements by the RCTs.	The FMM specimen chamber (including shielding) was designed to permit cleanup as necessary.  The FMM will be used to monitor waste per operating procedures, i.e., waste types which the SAR lists as requiring such monitoring.
DEQ	Draft Pierre to Hain Ltr.  ECL-113	9		The laser system used to prevent transfer cart and hoist operations when the beam is interrupted by an object does not appear to function well. Many objects within the PGS can interfere with the path of the beam, and yet not constitute a safety issue for cart/hoist operations. Such objects include idle gloves, dirt on the mirrors, transfer cart liners, and tools hanging on the inside walls of the PGS. An alternate method for ensuring cart/hoist safety should be considered.	See response to EPA Comment #4.



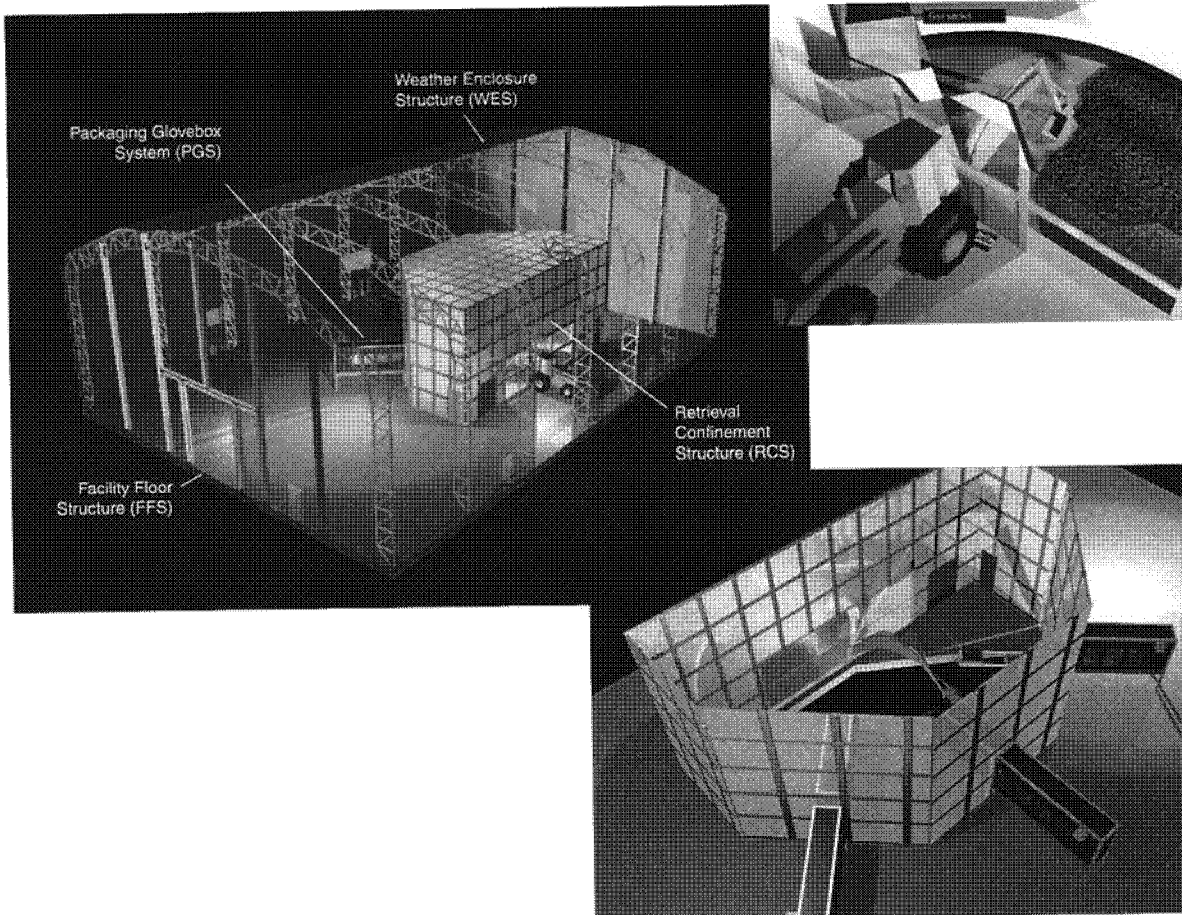
## **Attachment 1**

### **Operations Readiness Review Final Report for the Glovebox Excavator Method Project at the Idaho National Engineering and Environmental Laboratory**





**Department of Energy  
Nuclear Energy – Idaho Operations Office  
Operational Readiness Review Final Report  
for the  
Glovebox Excavator Method Project  
at the  
Idaho National Engineering and Environmental Laboratory**



**December 2003**

**Department of Energy  
Office of Environmental Management**

### Signature Page

I concur with the Team Leader in the findings and conclusions of this Operational Readiness Review for the Glovebox Excavator Method Project at the Idaho National Engineering and Environmental Laboratory in my assigned functional area.

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APPROVED: Brian G. Edgerton 12/10/03  
Brian G. Edgerton  
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NOTE - /s/ in signature block indicates original signature on file



## EXECUTIVE SUMMARY

This report documents the results of the Department of Energy (DOE) Operational Readiness Review (ORR) of the Operable Unit (OU) 7-10 Glovebox Excavator Method (GEM) Project's readiness for startup and operations including excavation, sampling, packaging, and characterization of the buried radioactive material. The DOE ORR was conducted in accordance with the approved DOE ORR Implementation Plan (Appendix B to this report) that was developed from the approved Plan of Action (Appendix B of the DOE ORR Implementation Plan). The scope of the DOE ORR included all areas and subjects specified in the Plan of Action.

The DOE ORR was started at the direction of the DOE Nuclear Energy – Idaho (NE-ID) Manager, following certification by the NE-ID Waste Management Division (WMD) Acting Director that the GEM Project and NE-ID line management had achieved a readiness to operate. An acceptable manageable list of open items that require resolution before start of operations has been identified. The DOE ORR was conducted between December 1 and 5, 2003.

The DOE ORR concluded that, subsequent to satisfactory closure of 3 previously identified pre-start issues, the GEM Project plant systems, personnel, and implementing programs and procedures are ready to commence safe and compliant operations. Overview of project safety and implementation documentation during the ORR indicated a clear flowdown of Authorization Basis requirements. Observed plant evolutions demonstrated a solid grasp and implementation of conduct of operations principles. Operations crews (A,B,C, & D) are well staffed with operator and support personnel, and are prepared to support 7x24 operations. Several ORR observations express reservation about reliance on a broadly empowered, expert-based Nuclear Facility Manager (NFM) for operations compliance. However, in light of the short operations period for the GEM Project (8-12 weeks), these concerns are noted as observations, for consideration by line management. Excellence was demonstrated in the GEM Project training program, including evidence of training records and objectives, lesson plans, comprehensive examinations and resultant knowledge and demonstrated proficiency of personnel. A Notable Practice in this regard, is noted in the DOE ORR. Personnel demonstrated, through interviews and operations evolutions, a good understanding and dedication to the guiding principles and core functions of Integrated Safety Management. The Emergency Preparedness (EP) functional area received a Notable Practice for establishing a dedicated Command Post within the Operations Command Building (OCB). While the quality assurance area provides a notable observation regarding implementation of lessons learned, feedback, and improvement. A post-start finding regarding less than adequate medical response by contractor responders from the Central Facilities Area (CFA) is noted as part of the DOE ORR. The latter deficiency does not directly affect startup of the GEM Project, however must be addressed by the contractor for general support considerations.

Several observations and the post-start finding address potential weaknesses in configuration management of facility authorization basis. Although not challenging objectives for safe operation of the GEM Project, particularly in light of the short duration

of operations, these issues point to a need to ensure proper understanding and consistent implementation of safety basis documentation at the RWMC for both NE-ID and BBWI organizations.

Prior to the DOE ORR, the GEM Project underwent several readiness assessments, including 2 Contractor Management Self-Assessments, a Contractor Operational Readiness Review (CORR), and an in-depth NE-ID Line Management Assessment (LMA). It was evident that the contractor line and supporting organizations had been thoroughly scrubbed and appropriately prepared to demonstrate operational readiness prior to the final DOE ORR verification audit.

NE-ID oversight personnel demonstrated a solid knowledge of the GEM Project and compliance to a well-established federal oversight program and management systems.

The DOE ORR Team Leader acknowledges the excellent support and cooperation provided by the contractor and NE-ID line management personnel and particularly the NE-ID GEM Project Manager, which allowed the ORR to proceed smoothly and most efficiently.

**Summary of Findings and Observations from the DOE ORR of the GEM Project:**

Core Functional Area	DOE ORR Findings, Observations, Notables	
Environmental and Waste Management	Criteria met	No findings, 1 observation
Emergency Preparedness	Criteria met	1 post-start finding, 1 observations, 1 notable practice
Fire Protection	Criteria not met <sup>(1)</sup>	No findings, 1 observations
NE-ID Readiness	Criteria met	No findings, no observations
Hoisting and Rigging	Criteria met	No findings, 1 observation
Management and Organization	Criteria met No findings,	No findings, no observations
Conduct of Maintenance	Criteria met	No findings, no observations
Operations	Criteria met	1 post-start finding, 5 observations, 1 notable practice
Quality Assurance	Criteria met	No findings, 1 notable practice
Radiological Protection	Criteria met	No findings, 2 observations
Safety Envelope/Nuclear Safety	Criteria met	No findings, 1 observation
Criticality Safety	Criteria met	No findings, 2 observations
Training	Criteria met	No findings, 1 observation, 1 notable practice
Configuration Management	Criteria met	No findings, 1 observation
Industrial Safety and Hygiene	Criteria met	No findings, 4 observations

<sup>(1)</sup> Pending satisfactory closure of previous, self-identified contractor pre-start issue

## **Glovebox Excavator Method Project.**

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**APPENDIX A – Team List and Qualifications Summary**

**APPENDIX B – GEM ORR Implementation Plan**

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**APPENDIX E – Dissenting Opinions**

# 1 INTRODUCTION

The Department of Energy (DOE) conducts Operational Readiness Reviews (ORRs) in accordance with DOE Order (O) 425.1B, *Startup and Restart of Nuclear Facilities*, and DOE Standard (STD) 3006-2000, *Planning and Conduct of Operational Readiness Reviews*. The purpose of this Operational Readiness Review (ORR) is to: (1) verify the readiness of the Glovebox Excavator Method (GEM) project to conduct safe, compliant operations including excavation, waste retrieval, characterization, and packaging of waste in the GEM facility located in the Subsurface Disposal Area (SDA) of the Radioactive Waste Management Complex (RWMC) on the Idaho National Engineering and Environmental Laboratory (INEEL); and (2) verify the readiness of the federal oversight role.

## 1.1 Background

The responsible contractor for the GEM project at the INEEL is Bechtel BWXT Idaho, LLC (BBWI). On April 18, 2002, a settlement ("Agreement to Resolve Disputes") between DOE Nuclear Energy – Idaho (NE-ID), the Environmental Protection Agency (EPA) Region X, and Idaho Department of Environmental Quality (IDEQ) resulted in a small demonstration project to remove actual waste from Pit 9 located at the RWMC. This demonstration project is expected to remove between 75 and 125 yds<sup>3</sup> of waste from Pit 9.

Pit 9 is located in the northeast corner of the Subsurface Disposal Area (SDA). Pit 9 was originally excavated to the underlying basalt layer to an average depth of approximately 20 feet (6m) and then back-filled with a layer of soil approximately 3.5 ft (1m) before waste was placed in the pit. The approximate dimensions of Pit 9 are 379 ft x 127 ft (116 m x 39 m). Disposal occurred in Pit 9 from November 1967 until June 1969. Approximately 4 to 6 ft (1.2 m to 1.8 m) of overburden was placed on top of Pit 9 with additional overburden placed on top of the pit in 1983. During the operational history of Pit 9, disposal of waste into the pit was accomplished by dumping drums and boxes into the pit, and placement of bulky items by crane. Soil was applied to cover the waste on a daily to weekly basis. The waste placed into Pit 9, which was received from Rocky Flats Plant (RFP), consisted of drummed sludge, assorted solid wastes, and cardboard boxes containing contaminated empty drums.

The GEM Project is comprised of structures including the weather enclosure structure (WES) also designated as WMF-671, which houses the retrieval confinement structure (RCS), a modified backhoe for soil overburden and waste zone retrieval, and a packaging glovebox system (PGS). Also housed within the WES are the safety systems, radiation monitoring equipment, utility systems, ventilation systems, and dust suppression systems.

Included in this startup are the following buildings and structures:

- Weather Enclosure Structure (WES) – Waste Management Facility (WMF)-671;

- Retrieval Confinement Structure (RCS);
- Packaging Glovebox System;
- Cold Test Pit South Mockup;
- Type II Waste Storage Building –WMF-628
- Other structures or areas, which were to be evaluated, include the Interim Storage Area, the Overburden Storage Area, the Assay Trailer, and WMF-750, also known as the Fire Riser Building.

The GEM Project will accomplish four primary objectives: 1) Demonstrate waste zone material retrieval, 2) Provide information on any contaminants of concern present in the underburden, 3) Characterize waste zone material for safe compliant storage, and 4) Package waste zone material for on-site storage.

## 1.2 Purpose of the ORR

The primary objective of the DOE ORR is to independently verify BBWI's readiness to commence excavation operations at Pit 9, including assay of retrieved waste, sampling and characterization, storage in WMF-628, and operation of the Cold Test Pit South Mockup. The second objective of the ORR is to verify the adequacy of NE-ID's oversight capacity with respect to the GEM Project.

## 1.3 Scope

The breadth of the ORR is defined in the GEM ORR Plan of Action (Appendix B of Appendix B to this report). The depth is defined in the GEM ORR Implementation Plan (Appendix B to this report) Criteria Review and Approach Documents (CRADs) included in the Implementation Plan. The CRADs served as the primary means by which the ORR team verified the readiness of plant systems, processes, personnel, and management programs to operate the GEM Project safely. The scope of the ORR includes the facilities listed in section 1.1 above.

This ORR addressed each of the 18 Core Requirements of DOE Order 425.1 B, *Startup and Restart of Nuclear Facilities*, and DOE-STD-3006-2000, *Planning and Conduct of Operational Readiness Reviews*.

The functional areas for the ORR included the following:

- Environmental and Waste Management (EN)
- Emergency Preparedness (EP)
- Fire Protection (FP)
- NE-ID Oversight (ID)
- Hoisting and Rigging (HR)
- Management and Organization (MG)
- Conduct of Maintenance (MT)

- Operations (OP)
- Quality Assurance (QA)
- Radiological Protection (RP)
- Safety Envelope/Nuclear Safety (SE)
- Criticality Safety (CS)
- Training (TR)
- Configuration Management (CM)
- Industrial Safety and Hygiene (IS)

#### **1.4 Team Composition**

The team members had no connection with the GEM Project that could have impacted their independence. Each member spent the necessary time receiving requisite training, touring the facilities included in the scope of the ORR and reviewing pertinent documentation prior to the ORR. The Team Leader certifies that each member is technically competent in their assigned area, has assessment experience, is independent, and has become adequately familiar with the facility. Team qualification summaries are included in Appendix A.

#### **1.5 Conduct of the ORR**

The team conducted the review in accordance with the GEM ORR Implementation Plan (Appendix B). The CRADs are included in Appendix B of this report (Appendix C of the Implementation Plan). The Team Leader reviewed the efforts of the team members to ensure that all objectives in the CRADs were thoroughly addressed. The Team Leader, in consultation with the Deputy Team Leader and the appropriate team member, had the responsibility for making the determination of whether an issue required a pre-startup or post-startup resolution. The criteria used to aid in this determination are included in the Appendix B of this report (Appendix D of the Implementation Plan). The review approach included review of procedures and pertinent documentation, interviewing personnel, inspecting equipment and facilities, and observing operations.

The team met daily during the on-site portion of the review to facilitate coordination of effort and exchange information. These meetings allowed the team members to discuss significant observations or issues identified during the day and permitted the Team Leader to identify any trends or areas where more detailed information was required. It also helped to highlight potential schedule conflicts or possible information gaps in time to take corrective action.

The quality assurance of the review process was the responsibility of the Team Leader and the Deputy Team Leader. That responsibility included oversight of the review process, daily on-site peer review of the findings of the team members, and specification of the form of reports on which the team's conclusions are based. This independence, coupled with the professional experience of the participants, was

intended to ensure an objective and comprehensive review that will provide senior management with confidence that key findings are presented in an objective and responsible manner. Any team member was free to issue a dissenting opinion in this final report.

## **2 ORR EVALUATION**

### **OVERVIEW**

The DOE ORR for the GEM Project was chartered to independently confirm that BBWI management has brought the facility to a state of readiness to start excavation of overburden soil, waste retrieval, packaging, characterization, and movement of waste containers into storage in accordance with the safety basis and with the management control programs in place to ensure safe operations can be sustained. Several important reviews and other events resulted in open actions for BBWI to complete and are important to understanding the results of this DOE ORR. The DOE ORR of the GEM Project readiness to operate therefore begins with the evaluations of prior readiness review performed by BBWI and NE-ID line management.

The BBWI ORR was conducted from October 27 through November 5, 2003. The BBWI ORR identified 13 pre-start findings, 6 post-start findings, and 11 observations. By the time the DOE ORR was complete, BBWI had completed corrective actions for all but 1 (one) of the pre-start findings. The remaining open BBWI ORR finding addresses post overburden removal re-establishment of the RCS confinement system.

The BBWI ORR was positive regarding GEM Project readiness to operate provided that certain deficiencies were addressed and corrected. Among the important conclusions from the BBWI ORR were strengths in maturity of the safety culture of the GEM project. The BBWI ORR noted weaknesses in training and qualification processes, conduct of radiological controls, procedures completeness, inconsistencies between sets of requirements, and issues management mechanisms. The BBWI ORR out-brief also identified the lack of a mature radiological control program.

The DOE ORR did not perform a comprehensive validation of completed corrective actions or of corrective action plans for open BBWI ORR findings. Validation of the BBWI ORR findings was done by NE-ID line management. However, as part of its coverage of each area, DOE ORR team members reviewed BBWI ORR findings where applicable. The DOE ORR found completed actions and planned corrective actions for open findings to have a reasonable and well-documented basis for closure. The DOE ORR also concluded that the scope and depth of the BBWI ORR were adequate to ensure readiness. Regarding the adequacy of the BBWI ORR, the NE-ID LMA stated that the depth and breadth of the contractor ORR was satisfactory. The NE-ID LMA also found that the Emergency Preparedness, Maintenance, Fire Protection, and Industrial Safety functional areas of the BBWI ORR had outstanding issues based on identification of twelve pre-start findings in the NE-ID LMA. The DOE ORR agrees with

these LMA conclusions. The number and character of the issues raised by the DOE-ID LMA and the contractor ORR indicate that the contractor likely used these audits as an additional mechanism to achieve readiness and prepare for the final DOE .

A NE-ID LMA began in November 3 and concluded on November 13, 2003. The LMA was performed pursuant to DOE-ID Order 425.A, *Startup and Restart of Nuclear Facilities*. The LMA was less positive than the BBWI ORR, having additional pre-start issues in the Emergency Preparedness, Maintenance, Fire Protection, and Industrial Safety functional areas. The LMA identified 12 pre-start findings and 22 post-start findings. NE-ID and BBWI discussed the results of the LMA and BBWI accepted the findings as written. At the time the DOE ORR commenced, one pre-start finding from the NE-ID LMA remained open. The remaining pre-start finding addresses procurement of required critical spare parts for the GEM Project. Additionally, BBWI self-identified a third pre-start issue associated with repair and freeze protection of the GEM Project fire protection system components. Closure of this issue was underway during the DOE ORR.

The DOE ORR confirmed BBWI's and NE-ID line management's readiness to proceed with safe operation upon satisfactory completion of the three remaining open pre-start findings, noted above. The DOE ORR did identify several observations, wherein improved operations may be achieved. Furthermore, the DOE ORR identified one post-start finding associated with emergency medical response (Post-Start – not facility specific).

Many complex and hazardous operations in DOE commence using a startup plan, which carefully structures and sequences operations using additional controls until operations and support organizations and management have gained proficiency and experience in the transition from "cold" operations to "hot operations. The startup period can be used to identify valuable lessons learned that can increase efficiency and productivity without sacrificing safety. BBWI recognizes these principles, which is evident in the approved "GEM Project Startup Plan" reviewed by the DOE ORR.

**Conclusion:** Upon satisfactory completion of the three outstanding Pre-Start findings noted previously, BBWI is ready to commence safe and compliant GEM Project operations. Furthermore, NE-ID has the qualified personnel and management systems in place to appropriately oversee GEM Project operations.

Evaluation summaries for each of the fifteen functional areas are provided below. The detailed Form 1s and Form 2s for each area are in Appendix C.

**Recommendations:** In addition to implementation of the corrective actions for the post-start findings, the DOE ORR team recommends consideration of and graded implementation of improvement measures associated with the teams' observations contained within this report. It is the opinion of the DOE ORR team, that the observations provide an opportunity to further enhance operations success for the GEM



Project. To the contractor's credit, action was taken to address many of these observations during the course of the DOE ORR.

## **2.1 Environmental and Waste Management (EN)**

The purpose of the Environmental and Waste Management functional area is to evaluate whether sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure services are adequate for safe operations. The Environmental and Waste Management functional area is also to determine that the applicable permits are in place and implemented within the facility.

The results of this review shows that the Environmental and Waste Management criteria were satisfied. The environmental support organization is well established with roles and responsibilities documented and understood. Adequate personnel are assigned to the project, and the ES&H Manager stated that additional support have been readily available as needed. The operators demonstrated the knowledge and abilities necessary to ensure that hazardous materials and wastes will be managed in accordance with applicable regulations and requirements.

The GEM Project, as a CERCLA activity, has documented the Applicable or Relevant and Appropriate Requirements and has accounted for them in engineering design files and procedures. The hazardous waste storage permit for WMF-628 accounts for the storage of the CERCLA waste generated from the GEM Project and provides for its regulatory status to remain under CERCLA upon removal. The review of GEM Project environmental and waste management did not result in any findings, and therefore, this functional area is found to be ready to commence operations.

### Findings: Pre-Start

None

### Findings: Post-Start

None

### Observations

**EN.1-1** Handling of the sampling portion of the sampling spoon with used gloves could cause cross-contamination resulting in inaccurate sampling results.

## **2.2 Emergency Preparedness (EP)**

The purpose of the Emergency Preparedness functional area is to evaluate whether the necessary support is established, sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure emergency preparedness is adequate for safe operations. The Emergency Preparedness functional area is also to determine:

- That the level of knowledge of emergency preparedness personnel is adequate;
- That the level of knowledge of operations support personnel is adequate based on reviews of examinations and examination results and selected interviews of operations support personnel; and
- That an operations drill program, including program records, has been established and implemented.

The Emergency Preparedness program was assessed for depth, breadth, and completeness to ensure that an adequate emergency preparedness program is in place for safe operation of the RWMC GEM Project. Overall, the emergency preparedness program is adequately staffed and functioning as intended and in compliance with NE-ID expectations. The Emergency Response Organization (ERO) serves the entire RWMC facility and has demonstrated the ability to fulfill its various duties and responsibilities satisfactorily. This ORR identified one notable practice within the emergency preparedness discipline as well as one observation and one finding of deficiency. The deficiency noted was identified within the emergency response to a GEM operational drill and is directed at the services provided by the INEEL Fire Department. No findings were identified against the RWMC ERO or against the GEM operational response capability in the areas of emergency preparedness.

#### Findings: Pre-Start

None

#### Findings: Post-Start

**EP.3-2** Equipment failure. The traction splint recently placed in service with the INEEL ambulance was not properly prepared prior to the emergency response activity and a back up splint was not obtained from the ambulance, which was approximately 50 yards away.

#### Observations

**EP.2-1** **Notable Practice** - The command post has recently been dedicated as a permanent facility rather than being used for dual duty as a conference room. The command post is left in a state of readiness that should assist ERO personnel in making as rapid a response as is possible to potential GEM Project emergency events

**EP.3-1** INEEL Fire Department response was less than adequate in treatment of the injured person for the operational drill of 12/02/03. The accident scenario included an injury to a GEM worker (broken femur bone in upper left leg). INEEL Fire Department personnel indicated that a new traction splint had been recently placed in service and did not function properly and/or was not configured properly for use. As a result of not using an appropriate splinting device, emergency response personnel did not immobilize the injured leg appropriately which could have and probably would have caused additional pain and injury to the injured party.

Additional personnel injury and damage could have been additional bleeding and potential injury to the artery serving the left leg.

### **2.3 Fire Protection (FP)**

The purpose of the Fire Protection functional area is to evaluate whether the necessary support is established and sufficient numbers of qualified personnel are provided to ensure fire protection support services are adequate for safe operation. The Fire Protection functional area is also to determine that the Fire Protection and life safety features have been provided that meet the requirements of Highly Protected Risk criteria.

The GEM Project Fire Protection Program is well staffed with sufficient number of qualified fire protection personnel and responsibilities for fire protection are clearly defined. The Fire Protection Organization is integrated into the GEM project organization. Fire protection systems are being tested and maintained as demonstrated by the contractor self-identification of fire suppression system deficiencies. The Fire Hazard Analysis for the project thoroughly examined the risks from fire and prescribed appropriate fire suppression systems. Life safety systems as well as exits and exit egress were found to be adequate to meet the requirements of Highly Protected Risk criteria.

#### Findings: Pre-Start

None

#### Findings: Post-Start

None

#### Observations

**FP.2-1** Two issues were identified during this ORR that involved the retrieval confinement structure (RCS) automatic sprinkler system and the packaging glovebox (PGS) system water mist system and are discussed in the text above. Because they were self identified by BBWI and are being tracked to closure, the issues were not recorded as Findings here. However, it is NE-ID's expectation that the two systems will operational and function as designed and as discussed and documented in the GEM Fire Hazards Analysis (FHA), before the GEM project goes operational.

### **2.4 NE-ID Oversight (ID)**

The purpose of the NE-ID Oversight functional area is to evaluate whether the technical and managerial qualifications of those personnel at the DOE field organization who have been assigned responsibilities for direction and guidance to the contractor,

including the Facility Representatives, are adequate. The NE-ID Oversight functional area is also to determine:

- That formal agreements between the operating contractor and DOE have been established via the contract or other enforceable mechanism to govern the safe operations of the facility;
- A systematic review of the facility's conformance to these requirements has been performed;
- That these requirements have been implemented in the facility, or compensatory measures are in place and formally agreed upon during the period of implementation; and
- That DOE approves the compensatory measures and the implementation period.

Also, the NE-ID Oversight functional area is to determine if the DOE operations office oversight programs such as occurrence reporting, Facility Representative, corrective action, and quality assurance programs, are adequate.

DOE-ID has an extensive training program to qualify Facility Representatives across the INEEL site (the training program extends to non-Facility Representatives as well). Four stages of training exist: DOE general technical, DOE-ID site-specific, functional area, and facility specific. A DOE-ID Facility Representative Program Manager is responsible for general Facility Representative training; Line Management is responsible for the facility-specific training and qualification. Each of these programs appeared strong, with senior Line Management actively involved in Facility Representative training and presence in the facilities. Facility Representative qualification requires successful completion of an oral board with the DOE-ID Deputy Manager for Operations.

A sufficient number of qualified Facility Representatives are available (4 minimum) to execute line management oversight responsibilities for GEM operations (up to the planned 24 hours per day, 7 days per week). These oversight capabilities will be supplemented with other line management engineers and managers to provide a broad bases and perspective for operational oversight.

DOE-ID and BBWI have approved/signed a formal agreement to govern the GEM project. These extend to regulatory requirements, DOE orders and criteria, and appropriate industrial and nuclear standards.

DOE-ID has an established occurrence reporting and emergency management system. For GEM, the Facility Representatives have been fully trained and qualified on the new Occurrence Reports and Processing System (ORPS) that recently (11/25/2003) went into effect at the site.

DOE Line Management takes responsibility for the GEM project oversight assessment program. An annual oversight plan is prepared, updated quarterly, and is coordinated with functional support organizations to ensure an effective review of each core discipline at least annually. Line Management will utilize support organization subject

matter experts, as required, to evaluate identified issues or potential issues to ensure appropriate categorization, and correction and closure if required.

Findings: Pre-Start

None

Findings: Post-Start

None

Observations

None

## **2.5 Hoisting and Rigging (HR)**

The purpose of the Hoisting and Rigging functional area is to evaluate whether the necessary support is established, sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure services are satisfactory for safe operations. The Hoisting and Rigging functional area is to determine if the level of knowledge of operations support personnel is adequate based on reviews of examinations and examination results and selected interviews of operations support personnel.

The hoisting and rigging program at this facility has been firmly established and is adequate to allow safe operation of the facility. A majority of the personnel within the facility have received hoisting and rigging training and can perform the lifts required by project operations. The lifting operations have been engineered to safely perform the necessary functions of the project and procedures have been established which clearly instruct the workers how to perform each required lift. The operators interviewed were knowledgeable in the hoisting and rigging necessary to support the safe operation of the facility and they demonstrated that knowledge by the performance of lifting activities in the facility and through a tabletop discussion of an additional lifting operation.

All hoisting and rigging equipment was observed to have current load tests, and the hoisting and rigging equipment was in good condition. Two pieces of equipment within the facility, which are utilized during the hoisting and rigging operations, are not labeled on the exterior to identify their load weight. Although this is not a requirement to have these pieces of equipment labeled with their weights identified, a best management practice would be to clearly identify their weights.

Findings: Pre-Start

None

Findings: Post-Start

None

## Observations

**HR.1-1** Two pieces of equipment within the facility, which are utilized during the hoisting and rigging operations, are not labeled on the exterior to identify their load weight. The soil overburden cartridge does not have the empty load weight and full load weight limit stenciled on the container. The RCS 6000 lb hoist-lifting fixture does not have the load weight stenciled on the fixture. These pieces of equipment have been evaluated to the weight limitations of the hoist, the electric pallet jacks, and the floor load limits, in combination with the loaded overburden soil bags and it was determined that lifts utilizing these components were well within the engineered designs of the equipment. Although this is not a requirement to have these pieces of equipment labeled with their weights identified, a best management practice would be to clearly identify their weights.

## **2.6 Management and Organization (MG)**

The purpose of the Management functional area is to evaluate whether the established functions, responsibilities and accountabilities are in place to ensure safe accomplishment of work. The Management and Organization functional area is also to determine:

- Personnel exhibit an awareness of public and worker safety, health, and environmental protection requirements;
- Personnel, through their actions, demonstrate a high-priority commitment to comply with these requirements; and
- That the functions, assignments, responsibilities, and reporting relationships [including those between the line operating organization and Environment, Safety and Health (ES&H) support organizations] are clearly defined, understood, and effectively implemented with line management responsibility for control of safety.

An evaluation of the breadth, depth and results of the BBWI Operational Readiness Review was adequate to verify the readiness of hardware, personnel, and management programs for safe operations is a component of the Management and Organization functional area.

Line management has established the functions, responsibilities and accountabilities to ensure safe accomplishment of work. Personnel exhibit an awareness of public and worker safety, health, and environmental protection requirements and, through their actions, demonstrate a high-priority commitment to comply with these requirements.

Functions, assignments, responsibilities, and reporting relationships [including those between the line operating organization and Environment, Safety and Health (ES&H) support organizations] are clearly defined, understood, and effectively implemented with line management responsibility for control of safety.

BBWI Operational Readiness Review was reviewed for adequacy with regards to the breadth, depth, and results of the CORR were adequate to verify the readiness of hardware, personnel, and management programs for safe operations for the functional areas addressed by the Plan of Action. This review was found to be sufficient in scope and detail to perform an adequate evaluation of the facility readiness for operation. The readiness review was performed in accordance with the approved Plan of Action and Implementation Plan and was effective in assessing the GEM Project for readiness. The identified issues and deficiencies were appropriately categorized and dispositioned.

The CORR had one environmental and waste management issue, an observation regarding waste management organizational roles and responsibilities not being clearly defined. The corrective action for that issue is documented in: CORR CAPWM-1-1, Roles and responsibilities for the WGS Representative are not clearly defined. The corrective actions are complete and found to be adequate and the roles and responsibilities are defined and understood. The two issues identified for the fire protection functional area are being addressed and tracked to closure.

The contractor's Operational Readiness Review (CORR) identified a number of Conduct of Operations implementation deficiencies that were addressed with vigor by GEM project management. The Conduct of Operations knowledge and performance of GEM personnel was determined to exceed the results documented in the CORR report.

A reoccurring issue noted in the NE-ID ORR of operations was errors in the execution of the lockout and tagout process. Both mistakes were administrative and based on events detected by GEM management. Neither the CORR nor the NE-ID ORR implementation plans specifically targeted the GEM LOTO program for review.

The CORR did not detect the unusual level of authority vested in the GEM Nuclear Facility Manager or peculiar method used by RWMC to specify minimum staffing for nuclear facilities. However, these issues were not evaluated as essential to the safe performance of the GEM demonstration project. Overall, the CORR was an effective evaluation of Conduct of Operations readiness for the GEM project.

Findings: Pre-Start

None

Findings: Post-Start

None

Observations

None

## 2.7 Conduct of Maintenance (MT)

The purpose of the Conduct of Maintenance functional area is to evaluate whether the management program support is established, sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure maintenance services are adequate for safe operations. The Conduct of Maintenance functional area is also to determine:

- That an adequate startup or restart program has been developed that includes plans for graded operations and testing after startup or resumption to simultaneously confirm operability of equipment;
- That the plans should indicate validation processes for equipment after startup or resumption of operations, including any required restrictions and additional oversight;
- That a program is in place to confirm and periodically reconfirm the condition and operability of safety SSCs, including examinations of records of tests and calibration of these systems;
- That the material condition of all safety, process, and utility systems will support the safe conduct of work; and
- That spare parts for Vital Safety Systems are identified and available with appropriate documentation.

The maintenance program at this facility is supported through the RWMC maintenance operations. All of the RWMC maintenance personnel are qualified to support operations at the GEM facility and there is a sufficient number of craft personnel to perform any anticipated maintenance that may be necessary in the facility to support safe operations. A startup program has been established to provide for a phased startup of operations within the facility. The first phase supports the start of overburden removal. After completion of the first phase additional maintenance and facility configurations tasks would be necessary to prepare for the second phase, excavation of waste.

Several walkthroughs of the facility indicated that the facility was in good overall condition, and all equipment requiring calibration was currently in calibration. It was verified that safety significant SSCs in the facility had been tested and/or were being inspected as necessary (primarily on an each shift frequency) to ensure their ability to function properly.

A mechanic and two electricians that support the GEM facility seven days per week (during the day shift), with additional mechanics and electricians supporting the facility from Monday through Thursday. There are other craft personnel (carpenters, painters, pipe fitters, etc.) to support the facility as necessary.

Spare parts issues were identified with the Line Management Assessment and the facility is working to acquire the necessary spare parts prior to startup



Findings: Pre-Start

None

Findings: Post-Start

None

Observations

None

## **2.8 Operations (OP)**

The purpose of the Operations functional area is to evaluate whether the personnel exhibit an awareness of public and worker safety, health, and environmental protection requirements and, through their actions, demonstrate a high priority commitment to comply with these requirements. The Operations functional area is also to determine:

- That the formality and discipline of operations is adequate to conduct work safely;
- That programs are in place to maintain this formality and discipline;
- That there are adequate and correct procedures and safety limits in place for operating the process systems and utility systems, including procedures for dispensing with classified objects;
- That procedures, as affected by facility modifications, are consistent with the description of the facility, procedures, and accident analysis included in the safety basis;
- That a sufficient numbers of qualified personnel are available to conduct and support safe operations, including operators and security support personnel qualified to dispense with classified objects; and
- That the technical and management qualifications of contractor personnel responsible for facility operations are adequate.

Operators, technicians, foremen, and supervisors observed during the GEM ORR exhibited OUTSTANDING knowledge and performance related to Conduct of Operations. The assessor was highly impressed with the formality of operations, the dedication to procedural compliance, and the ingenuity demonstrated by GEM facility personnel. The issues cited for the Operations objectives revolved around the peculiarities of RWMC management and NE-ID management acceptance of these anomalies. Unlike other INEEL nuclear facilities, the GEM NFM has been empowered by local procedure and practice to interpret and alter procedural requirements, establish facility apportionment related to TSR operating modes, establish and/or vary minimum staffing requirements for nuclear operations, and determine (apart from procedural prerequisites) which GEM support systems are necessary to support safe conduct of specific nuclear operations. The authority of and reliance upon the expertise of the GEM NFM introduces an expert-based component into what would otherwise be a standards-based safety management system.

Although the current GEM NFM appears uniquely qualified to execute this unusual level of authority with discretion, any unexpected change in management of the GEM project could impact the company's ability to recover and package the waste safely. Given the relatively short operations lifetime of the GEM demonstration project, no immediate corrective actions should be necessary. However, more extensive waste recovery and packaging operations for OU 7-10 will require a straightforward standards-based safety management approach.

Findings: Pre-Start

None

Findings: Post-Start

**OP.4-1** Contractor management above the level of GEM Nuclear Facility Manager, and some levels of NE-ID management, did not demonstrate rigorous application of Nuclear Safety Rule provisions in regard to DSA review and approval and strict compliance with TSR administrative controls, contrary to the requirements of 10 CFR 830.

Observations

**OP.1-1** RWMC operators and management, as well as NE-ID management, have accepted the GEM NFM's authority to interpret procedure intent, to direct performance of procedure steps out of sequence or in reverse order, and to direct performance of procedures or portions of procedures when prerequisites regarding facility mode are not met. Such authority is expert-based, inconsistent with the ISM expectation that instructions be sufficiently flexible to be performed as written, and contrary to the requirements of DOE Order 5480.19 Chapter XVI section C.2.g, C.2.j, C.7 and BBWI MCP-2985 section 3.7.

**OP.2-1** The WMF-671 Shift Supervisor approved a Level II LOTO for the GEM ventilation main exhaust fan, but was not authorized as Primary Authorized Employee to grant the approval under RWMC LOTO implementing procedure MCP-3227.

**OP.2-2** **Notable Practice** – GEM operators, technicians, the foreman and shift supervisor demonstrated an OUTSTANDING level of performance for Conduct of Operations knowledge and operating principles during the GEM ORR.

**OP.3-1** The GEM TSR allows different operating modes for different "portions" of the GEM facility, but does not define the apportionment or establish boundaries. The apportionment of the GEM facility has been established instead via procedure. The RWMC SAR and TSR also allows specification of minimum staffing via technical procedures [see objective OP.4]. Until known deficiencies in the BBWI USQ process and NE-ID

oversight of the USQ process are resolved, the failure to establish TSR level portion boundaries and minimum staffing presents an error likely situation in which changes can be adopted without an effective review of safety basis implications.

- OP.3-2** Contrary to the requirements of Conduct of Operations procedures MCP-2985, BBWI MCP-1311 includes two errors that should have been detected and corrected during procedure preparation and validation. MCP-1311 erroneously states that OPERATION mode is not defined for the entire GEM facility, and erroneously states that the NFM can direct performance of operational procedures or portions of procedures, in some cases, even though the mode specified by the procedure prerequisites has not been established.
- OP.3-3** Contrary to the requirements of DOE Order 5480.19 and clause I.19 of the current operating contract, the contractor failed to include adequate prerequisites in GEM operating procedures to ensure known hazards are properly mitigated for anticipated and abnormal GEM operating conditions.

## **2.9 Quality Assurance (QA)**

The purpose of the Quality Assurance functional area is to evaluate whether the necessary program support is established, roles and responsibilities are established, sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure quality assurance services are adequate for safe operations. The Quality Assurance functional area is also to determine:

- A feedback and improvement process has been established to identify, evaluate, and resolve deficiencies and recommendations made by oversight groups, official review teams, audit organizations, and the operating contractor;
- That the level of knowledge of operations support personnel is adequate based on reviews of examinations and examination results and selected interviews of operations support personnel; and
- That the excavation equipment and facility support equipment have been designed, procured, modified, fabricated, tested, and certified in accordance with applicable DOE requirements.

The project Quality Assurance function was assessed for depth, breadth, completeness and adequacy to ensure that a quality assurance program adequate for the project is in place. Adequacy is based on ensuring safe operation of RWMC GEM Project.

The QA function has a good working relationship with project management.

QA function staff are adequately trained, experienced professionals. Staffing is planned, rationally determined and appears adequate for the project. QA function roles

and responsibilities are well documented, understood and implemented. Assessments are planned and conducted. Deficiencies are identified, tracked, trended and adequately dispositioned. The QA function has a demonstrated ability identifying vulnerabilities and driving remedies suitable for the project.

A rational and controlled graded approach to applying the appropriate level of quality assurance for design, procurement and receipt inspection appears to be effectively implemented.

No deficiencies and one notable practice were identified.

The project Quality Assurance function for the GEM project appears to provide an adequate level of quality assurance for safe operation of the project.

Findings: Pre-Start

None

Findings: Post-Start

None

Observations

**QA.1-1**

**Notable Practice** - In an effort to more effectively implement ISMS Core Function 5 - Feedback and Improvement, the self-assessment coordinator at RWMC has developed, at his own initiative, a RWMC Self-Assessment Feedback Report and system that provides assessors with the results of issues they identify.

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## **2.10 Radiological Protection (RP)**

The purpose of the Radiation Protection functional area is to evaluate whether an adequate number of qualified personnel are available for the safe handling and storage of the radioactive materials in the facility. The Radiological Protection functional area is also to determine:

- That the Radiological Protection Program had adequate tools;
- That the tools are calibrated and maintained; and
- That the facility is functioning within an established RP Program.

The review was conducted through procedural reviews, personnel interviews, facility walk downs, and observation of both routine and upset conditions. Included in the DOE ORR RP review was the adequacy of both the contractor ORR and the DOE line management assessment.

The conclusion of this review is that the criteria as defined in the DOE GEM Implementation Plan RP functional area is met. The GEM Project radiological

protection program support is established, sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure operational support services are adequate for safe operations. Radiological protection program functions, assignments, responsibilities, and reporting relationships are clearly defined, understood, and effectively implemented. The Radiation protection program is adequately staffed with qualified personnel.

The level of knowledge of operations and radiological support personnel is adequate to conduct radiological operations for the GEM project. Radiological protection personnel demonstrated the ability to carry out normal, abnormal, and emergency procedures under their cognizance. Radiological protection support personnel are knowledgeable of radiological requirements and principles contained in 10 CFR 835 and the Radiation Protection Program.

Findings: Pre-Start

None

Findings: Post-Start

None

Observations

**RP.1-1** Shop vacuum cleaners, in the PGS, are not filtered. These housekeeping vacuum cleaners have the potential to create additional spread of fine particle contamination throughout the PGS. They should be replaced with filtered vacuum cleaners (not to be interpreted as nuclear grade HEPA filtered).

**RP.2-1** GEM Operators have the perception that "just a little bit of Pu will kill you". Discussion with the GEM Radiological Control Engineer and review of the applicable lesson plan indicates the GEM Operators were provided the correct training.

## **2.11 Safety Envelope/Nuclear Safety (SE)**

The purpose of the Safety Envelope functional area is to evaluate whether the facility authorization basis documentation is in place and implemented describing the "safety envelope" of the facility. The Safety Envelope functional area is also to determine:

- That the safety structures, systems, and components (SSCs) are defined;
- That a system to maintain control over their design and modification is established; and
- That the necessary engineering support functions are established;
- That a sufficient numbers of qualified personnel are provided; and
- That adequate facilities and equipment are available to ensure engineering support services are adequate for safe operations.

From the review of documentation, interviews of facility operators, management, engineering, training and technical personnel, as well as observations of waste handling, sorting and packaging evolutions and TSR surveillances, it was determined that there is agreement between facility documentation and the safety authorization basis.

Plant management, operations personnel, engineering, and training staff were knowledgeable about safety basis documents, facility safety systems, and procedures. Inconsistencies in safety documents were discovered and these were immediately addressed by the performance of a USQ screen. The USQ screen was negative.

The BBWI ORR identified a pre-start finding in the safety basis area, SE.1-2 relative to the safety significant SSC confinement function of the Retrieval Confinement Structure not adequately implemented in the GEM project plans and procedures. A corrective action plan was developed and a maintenance work order was approved. The work order will be executed upon completion of overburden removal.

Objectives SE.1 and SE.2 were met for the SE functional area.

Findings: Pre-Start

None

Findings: Post-Start

None

Observations

**SE.1-1**

The descriptions used for REPAIR MODE between the DSA and TSR are inconsistent. The DSA defines REPAIR MODE for the facility in its entirety whereas the TSR defines REPAIR MODE for the facility or a portion of the facility. This inconsistency was reflected in the lesson plan for the safety basis document. The lesson plan uses the DSA definition but further explains that Glovebox 1 may be in the REPAIR mode while Glovebox 2 & 3 may be in the OPERATION mode. These inconsistencies in the safety documents were addressed immediately by a USQ screen. The USQ screen was negative.

## **2.12 Criticality Safety (CS)**

The purpose of the Criticality Safety functional area is to evaluate whether the necessary program support is established, sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure criticality safety support services (e.g. criticality safety operating limits) are adequate for safe operations. The Criticality Safety functional area is also to determine that the level of knowledge of operations support personnel is adequate, based on reviews of examinations and

examination results and selected interviews of operations support personnel involved in criticality safety.

The review was conducted through procedural reviews, personnel interviews, facility walk downs, and observation of both routine and upset conditions. Included in the DOE ORR Criticality Safety review was the adequacy of both the contractor ORR and the DOE line management assessment.

The conclusion of this review was that the GEM Project operating contractor has established an adequate criticality safety program. This program has sufficient numbers of qualified personnel and adequate facilities and equipment are available to ensure criticality safety is sufficient for safe operations. Criticality safety operating limits (CSOLs) are implemented in facility operating procedures, and appropriate postings are established within the facility.

The level of knowledge of operations support personnel is adequate for criticality safety related operations of the GEM Project. GEM Project operations and operations support personnel in the criticality safety area demonstrated the ability to safely carry out procedures under their cognizance.

Findings: Pre-Start

None

Findings: Post-Start

None

Observations

- CS.1-1** Some GEM Operators were not aware of the expected Fissile Material Monitor Response for PGS fissile measurements greater than 100 fissile gram equivalent (i.e., does the FMM provide actual FGE values, a warning or, both?).
- CS.2-1** Some GEM Operators were not familiar with what waste types were expected to have the highest fissile content.

## **2.13 Training (TR)**

The purpose of the Training functional area is to evaluate whether the necessary support functions, responsibilities and accountabilities are established. The Training functional area is also to determine:

- That a sufficient numbers of qualified training personnel are provided;
- That adequate facilities and equipment are available to ensure training support services are adequate for safe operations;

- That the selection, training, and qualification programs for operations and operations support personnel have been established, documented, and implemented;
- That the training and qualification program encompasses the range of duties and activities to be performed; and
- That the level of knowledge of managers, operators, and operations support personnel is adequate based on reviews of examinations and examination results and selected interviews of managers, operating, and operations support personnel.

The training and qualification programs for personnel have been established, documented, and implemented and the training encompasses the range of duties to be performed. The training organization is staffed with well-qualified, experienced and knowledgeable personnel. The training staff is motivated and optimistic about the project.

The BBWI training staff developed a phased approach to the GEM training program to accommodate the diverse experience, qualifications and educational backgrounds of operations personnel. Using a systematic approach to training methodologies, a very comprehensive and rigorous classroom instruction and OJT program was developed. The selection process and applicable position-specific training for managers ensured competence is commensurate with responsibilities. Observations of the well performed training evolutions with strict compliance to procedures, in addition to interviews with GEM operation and management personnel, was evidence of the effectiveness of the training program.

Industrial safety and hygiene review as well as emergency preparedness areas of emphasis for this ORR indicate that the level of knowledge of managers, operators, and operations support personnel is adequate. This input is based selected interviews of managers, operating, and operations, support personnel relative to industrial safety and hygiene principles as well as for the emergency preparedness discipline.

Observations during this ORR indicate that the level of operator knowledge is adequate to operate safely. This includes knowledge of radiological protection, industrial safety, and technical safety requirements associated with the operators' responsibilities. Personnel who will perform operations give adequate attention to and retain a practical understanding of systems, operations, and health, safety, and environmental protection issues. Operators demonstrate a working knowledge of systems and components related to safety and the authorizations basis.

Objectives TR.1, TR.2, TR.3, and TR.4 were met for the TR functional area

Findings: Pre-Start  
None



Findings: Post-Start  
None

Observations

- TR.2-1**      **Notable Practice** - Training personnel interviewed are extremely knowledgeable and competent in training and regulatory requirements and procedures. They are experienced and educated in training processes and very knowledgeable in safety document and GEM operational requirements. The Training Department interfaced with GEM operations personnel to develop a high quality GEM training program to meet GEM management's expectations.
- TR.4-1**      The revision to Plan-127, Radioactive Waste Management Complex Training Implementation Matrix, Addendum A, OU 7-10 GEM, Revision 5, 5/28/03 is actually REVISION 0. The revision to the Radioactive Waste Management Complex Training Implementation Matrix (TIM) became REVISION 5 when the addendum was added. DOE approved Addendum A, OU 7-10 GEM, Revision 0 to the RWMC TIM in DOE Letter EM-WM-02-225.

## **2.14 Configuration Management (CM)**

The purpose of the Configuration Management functional area is to evaluate whether the necessary configuration management program is established. The Configuration Management functional area is also to determine that the facility systems, as affected by facility modifications, are consistent with the description of the facility, procedures and accident analysis included in the safety basis.

The Configuration Management program has been established and is documented in the Program Requirements Document, PRD-115. Engineering changes are controlled by the Design Control procedure, MCP-2811, which documents the process for evaluating and making engineering changes to systems or components. The Configuration Management program was reviewed and it was verified that facility or equipment changes are documented in updated systems drawings. A spot check of drawings indicated that they were up to date and included recent modifications to systems within the GEM facility.

One observation indicated that some prints within the GEM facility were not clearly identified as controlled copies. A review of prints utilized by the Shift Supervisor prior to establishing the LO/TO for a maintenance evolution indicated that some prints in the book "Master and Essential Key Drawings, WMF-671" did not have "control copy" stamped on the prints. The book did contain an index, which described the documents and respective revision number, but not all of the prints in the binder were identified as controlled copies.

Findings: Pre-Start

None

Findings: Post-Start

None

Observations

**CM.1-1** A review of prints utilized by the Shift Supervisor prior to establishing the LO/TO for a maintenance evolution indicated that some prints in the book "Master and Essential Key Drawings, WMF-671" did not have "control copy" stamped on the prints.

## **2.15 Industrial Safety and Hygiene (IS)**

The purpose of the Industrial Safety and Health functional area is to evaluate whether the occupational safety and industrial hygiene necessary support is established. The Industrial Safety and Hygiene functional area is also to determine:

- That a sufficient numbers of qualified personnel are provided
- That adequate facilities and equipment are available to ensure services are adequate for safe operations; and
- That the level of knowledge of operations support personnel is adequate, based on reviews of examinations and examination results and selected interviews of operations support personnel.

The industrial safety and hygiene program was assessed for depth, breadth, and completeness to ensure that an adequate industrial safety and hygiene program is in place for safe operation of the RWMC GEM Project. Overall, the industrial safety and hygiene program is adequately staffed and functioning as intended and in compliance with NE-ID expectations. The industrial safety and hygiene serves the entire RWMC facility and has demonstrated the ability to fulfill its duties and responsibilities relative to the GEM Project satisfactorily. This ORR identified four observations in the area of industrial safety, which will increase the level of safe operations for GEM personnel.

Findings: Pre-Start

None

Findings: Post-Start

None

Observations

**IS.1-1** Review of PGS operations indicated the need for GEM Operators with long arms to place the FMM sample container in the sample holder. An operator tool should be provided to assist operators that do not have long enough arms to conduct this activity comfortably.

- IS.1-2** Review of PGS operations indicates the need to two persons to remove the Drum-out Lid. A tool has been provided to assist in this activity, but operators did not demonstrate familiarity with this tool during the observed PGS evolution.
- IS.2-1** An area for improvement was identified during the drill evolution on 12/02/03. GEM Project personnel trained in first aid should be more cognizant of proper treatment of injured personnel relative to shock. During the drill, personnel should have been quicker in covering the injured person with a jacket/coat in order to keep the patient as warm as possible prior to ambulance arrival. Emergency response focus is apparent on radiological concerns but should be enhanced relative to general first aid at the scene of personnel injuries.
- IS.2-2** GEM personnel need to be more consistent in employing the recommended 3 points of contact during ascending and descending stairways at each of the PGS platforms. Trips and falls can be a serious hazard and could result in serious injury. Training has been provided and reminders to the employees were provided in pre-job briefings. Observation during the ORR indicated that consistent use of handrails is not ingrained in the workforce as yet.

### **3 ISMS EVALUATION**

The DOE ORR did not specifically review the Integrated Safety Management System (ISMS) for the GEM Project. However, the core functions and guiding principles of an integrated safety management system in accordance with DOE Policy 450.5 are generally addressed in the assessment criteria used for performing the DOE ORR. Also, DOE Order 425.1B requires comment on the status of ISMS implementation in the final ORR report.

The functional reviews conducted under this DOE ORR of personnel, procedures, and programs demonstrated that the functions and principles of Integrated Safety Management are implemented in the GEM Project. Furthermore, the Team observed that the personnel demonstrated competence commensurate with their responsibilities during the interviews and evolutions.

The DOE ORR noted a mature safety culture within the GEM Project. Worker involvement was evident during all aspects of the operational demonstrations. Interviews and observations indicated a strong commitment to the functions and principles of the Integrated Safety Management System. Integrated Safety Management is mature and effective for the GEM Project.

## 4 LESSONS LEARNED

1. The contractor's establishment and daily maintenance of a "DOE ORR Event Timeline" proved to be a valuable aid for coordination of shift evolutions, plant operations, and personnel interviews throughout the ORR field activities.
2. The maintenance of a GEM Project DOE ORR Assignment and Work Product Cross-Reference table was useful for confirming DOE team member lead and support assignments for ORR Report products (e.g. CRADs, Functional Area Summaries, ISMS feedback, and Lessons Learned input).
3. The establishment and daily update of an internal "GEM Project ORR Schedule" was helpful in communicating and planning ORR work products for the ORR performance period.
4. Although the on-site conference area reserved for the DOE ORR team was well set up, network linking with the available computer terminals to the DOE operating system was not available, and did require additional effort on the part of the team members (e.g. transfer of diskettes, travel to different work sites, etc.). It is suggested that a network link be pre-established, where possible, with the NE-ID to facilitate team coordination.
5. Maintenance of a shared "GEM ORR" drive was useful, for those team members able to access the NE-ID computer system. The "pre-staging" of ORR Form 1's and Form 2's on the shared drive did save time and effort on the part of the team members.
6. Despite availability of standard form 1's and 2's templates on a shared "GEM ORR" drive, some team members used non-standard forms, thereby requiring additional editing effort. All team members should be strongly encouraged to use a single standard ORR template.

## **Attachment 2**

### **NE-ID Authorization to Commence Retrieval Operations at the Glovebox Excavator Method Project**



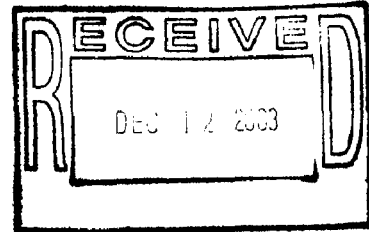
CCN 46877



**Department of Energy**

Idaho Operations Office  
850 Energy Drive  
Idaho Falls, Idaho 83401-1563

December 11, 2003



Mr. John M. Schaffer, Director  
RWMC Clean Close Project  
Bechtel BWXT Idaho, LLC  
2525 Fremont Avenue  
P.O. Box 1625  
Idaho Falls, ID 83415

**SUBJECT:** Authorization to Commence Retrieval Operations at the Glovebox Excavator Method (GEM) Project - (EM-WM-03-129)

**REFERENCE:** 1. DOE Operational Readiness Review Final Report  
2. Letter, S. G. Stiger to Elizabeth D. Sellers, Subject: "READINESS TO PROCEED MEMORANDUM, DECLARATION OF READINESS FOR OU 7-10 GLOVEBOX EXCAVATOR METHOD (GEM) PROJECT DOE OPERATIONAL READINESS REVIEW (ORR)," dated November 24, 2003

Dear Mr. Schaffer:

Based upon the recommendation of the DOE Operational Readiness Review in Reference (1) and NE-ID line management certification, DOE authorizes a phased startup of the OU 7-10 GEM facility in accordance with PLN-1360, *Startup Plan for the Operable Unit (OU) 7-10 Glovebox Excavator Method Project*.

The Phase 1 prerequisites of PLN-1360 must be completed and validated by BBWI prior to overburden removal. In addition, the heat tape must be added to the fire protection system, and verified by NE-ID line management personnel, prior to overburden removal. The prestart finding concerning the installation and testing of the seals on the Retrieval Confinement Structure provided in Reference (2) must be completed and validated by NE-ID line management, and the Phase 2 prerequisites of PLN-1360 have been verified complete by BBWI, prior to waste zone material handling operations.

Sincerely,

A handwritten signature in cursive script, appearing to read "Elizabeth D. Sellers".

Elizabeth D. Sellers  
Manager

cc: R. Miklos, BBWI, MS 4210  
J. Uptergrove, BBWI, MS 4210